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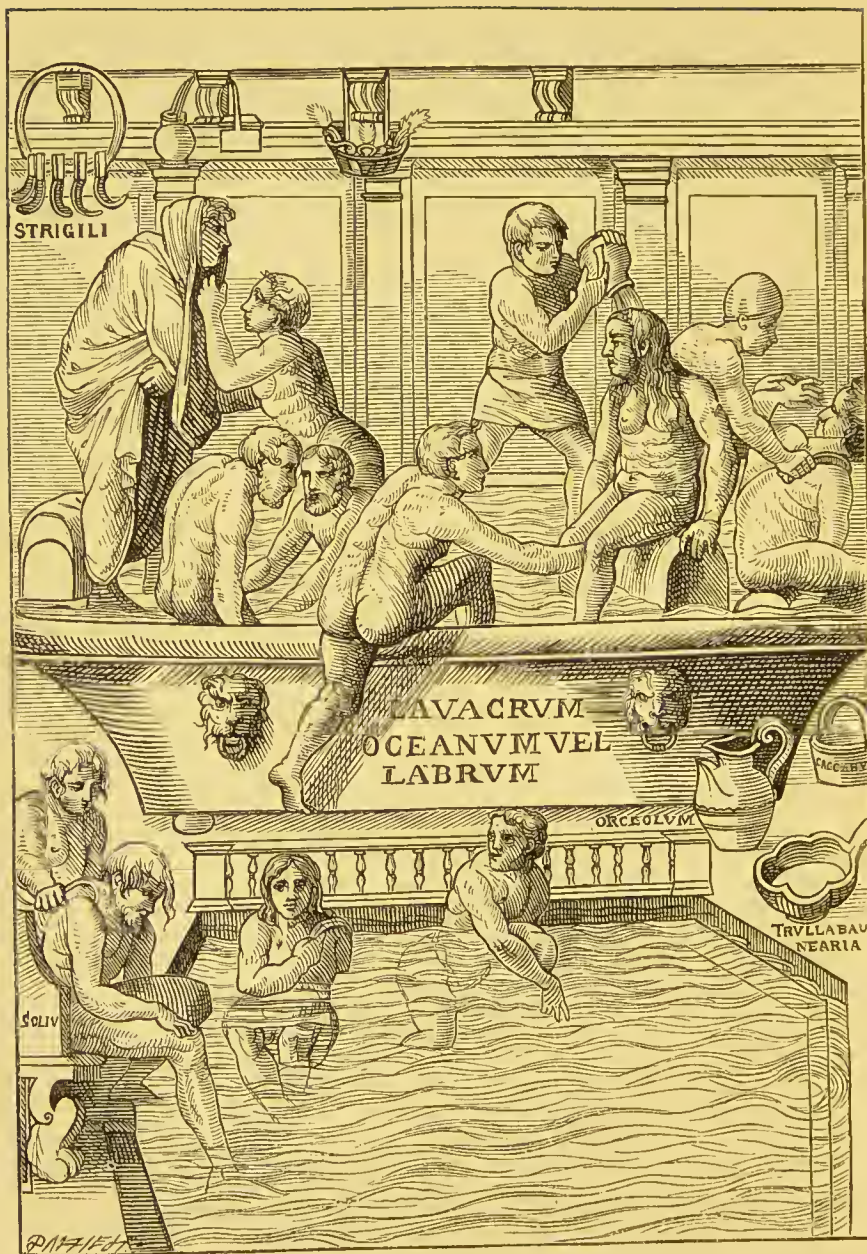


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THE
MUSCLES AND THEIR STORY,
FROM THE EARLIEST TIMES.



FRONTISPIECE.

(See page 86.)

THE
MUSCLES AND THEIR STORY,
FROM THE EARLIEST TIMES;

INCLUDING

THE WHOLE TEXT OF MERCURIALIS, AND THE OPINIONS
OF OTHER WRITERS ANCIENT AND MODERN, ON
MENTAL AND BODILY DEVELOPMENT.

BY

JOHN W. F. BLUNDELL, M.D.,
LICENTIATE OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.
AUTHOR OF "MEDICINA MECHANICA," ETC.

"Salus populi suprema lex."

LONDON :
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1864.

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THIS SMALL WORK

IS

Dedicated

TO

ADOLPHUS KLOCKMANN, ESQ.,

IN

REMEMBRANCE OF MANY KINDNESSES, AND OF HIS LONG AND
CONSISTENT ADVOCACY OF

RATIONAL GYMNASTICS.

PREFACE.

IF it be a matter of true history that on the introduction of wigs and monster perukes manly exercises gradually disappeared, then should we have more hope of the present generation of mankind. Still, for its benefit, and to treat fully of these exercises and of gymnastics especially, we must go back to the inventors of them—the so-called ancients. It was for this purpose, and with much diffidence as to his fitness for the task, that the writer and compiler of the present volume commenced seven years ago to prepare for publication a translation of the well-known “*Arte Gymnasticâ*” of Mercurialis,—a work that for two centuries at least has furnished almost every compilation of the kind with the fullest historical details of the art. On the completion of the translation however it was found, though rich in all for which that work is famous, too diffuse and verbose to suit the modern reader, whilst its being written in what has been not inaptly termed “sixteenth century Latin,”

rendered even a free translation equally unacceptable. And this may be said without any disparagement whatever of the elegant and classical author, whose work was truly the labour of a life, condensing, as it does, from nearly two hundred ancient writers, all that they have written in favour of applying bodily exercise not only to the purposes of health but to the treatment of disease. It is sought in these pages simply to render the modern reader familiar with what the ancients thought of the art they had originated and the numerous medical appliances of which it was susceptible.

It has been no small or little anxious labour, the arrangement of all these particulars, scattered as they are through no less than six books; to divest them of obsolete argument without impairing their sense, as well as to make them subservient to the knowledge of the present day. Oftentimes the obscurity both of the ancient and more modern writer rendered the task extremely difficult, for the desire has been to record in intelligible language what the ancient authors said and meant on this subject, without departing from the strict text of *Mercurialis*. To have presented their somewhat crude notions on points which modern physiology has already disposed of would have been to render the work not only unsavoury to the student but practically useless to the general reader. Here, in truth, lay the difficulties which beset the repro-

duction of old thoughts—thoughts retained for the sake of the facts which gave rise to them. Those facts, though they met the eye of the inquirer many thousand years ago, are the same as meet the eye of the modern observer. They are the open as well as secret signs of vital action ; and therefore it is that we can afford to dispense with the antique and substitute a present-day interpretation of these facts. So far then the researches of Mercurialis are embodied in the present work, and under any other circumstances their reproduction would have been impracticable.

The scant and uncertain leisure afforded by professional duties has spread the labour of this work over the period already specified, but this has not been without, it is hoped, some compensating advantages. During those years the author has been enabled, not only to mature and weigh previous thoughts on this subject, but from time to time to note down modern experiences as they arose. These have been also so critically interwoven as it were with the original text as to adapt the work more completely to the times in which we live. To the elaborate and learned treatise of Mercurialis therefore belongs almost the entire bulk of the ancient authorities and classical examples of the work ; and the earnest hope of the writer is that these shall be found faithfully rendered.

The volume, moreover, is completed at a time when the

subject of which it treats finds more favour with the public than formerly. This is no less hopeful though the work commenced without any cheering prospect of the kind. So far too the latter may be deemed equally encouraging, for there is no subject connected with *hygiene* which men are so prone either utterly to neglect or to run into the most dangerous extremes with regard to it. The author has no sympathy with gladiatorial displays, nor does he believe that such teaching is necessary to the promotion of national physical development. On the contrary he has sought to exhibit the enormities which in all times have arisen from such practices, and to show that bodily development and physical education are governed by those undeviating and eternal laws with which the human framework is surrounded; and the histories of Greece and Rome furnish irrefragable proofs of the extremes to which nations as well as individuals are prone in dealing with the subtle impulses of man's physical nature.

This work is after all rather a history than a treatise on exercises; yet there may be found in it that which is practically serviceable, much that will give rise to serious thought on the part of the reader; and beyond these the latter may trace the arguments for and against exercise discussed in all their bearings, such as it has been endeavoured, by long and careful consideration, to make sound and trustworthy. The reception which a work that

has long occupied his earnest thoughts will meet with cannot fail to be a matter of some concern to its author; yet whatever be the fate of the present attempt to establish the proper place and position of bodily exercise among the means of health, as well as the prevention of and recovery from disease, he can look back with pleasure to the solace its preparation has so often afforded him, and now even with regret at the final completion of the undertaking.

TUNBRIDGE WELLS,
May, 1864.

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THE MUSCLES AND THEIR STORY.

CHAPTER I.

Muscular Development a part of Education—The “*Mens sana in corpore sano*”
—Error of the present day in destroying the harmony between the
Nervous and Muscular Tissues—Bathing and Exercise should be insepa-
rable—Influence on the Intellectual faculties—Wear and Rust—Longevity
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age.”

WERE we asked to give a definition of the comparative values of bodily exercise and of habitual inactivity, we should declare that the former promotes life without hurrying it, and the latter hurries life without promoting it. The one economises the expenditure of the vital force peculiar to the working organs of the body, whilst the other consumes it. And yet the contrary may equally happen from immoderate exertion. The body, possessing functional powers given to last a certain time, endures according to the expenditure of those powers, subject, of course, to the “accidents of existence” as well as our own acts. The advantages of moderate and careful exercise are too numerous to mention in this place; they will be found scattered through this book. Its sterling value to the

human race is that, as man cannot live by mathematical rule, he possesses in it a natural and pleasurable aid by which any excesses may be carried off and errors often redeemed. To be healthy, however, and free from the insidious chances of organic disease, he must at the same time live temperately. He must not make exercise subservient to grossness of living; for if he do, he will suffer, as the ancients too often did, from premature exhaustion of the various functions of the body. Exercise is, in short, the "helping hand" stretched forth to assist and enliven the various daily functions of his framework, whilst the other condition is dragging it through the mire. By this too we may partly, if not wholly, understand how it is people are puzzled when they see a man pass away early in life who had yet been addicted to exercise and the sports of the field, and was notorious for his activity in these respects. Bodily exercise sinks then in their estimation, and the unity of the frame, and its mutually dependent systems of organisation, are entirely overlooked.

With the *ancients*, as it should be with ourselves, *age* was obviously held to be a *relative thing*, and it can hardly yet be said that we have improved on the suggestions they have furnished us regarding it. Men of mature years in those times exercised to "ward off old age." The principles which guide and control human life must be ever the same. Man in his purely physical being, though his nature be adapted to climate and local circumstances, is yet the same yesterday, to-day, and for ever. We differ from our fellows in *degree*, but little in *kind*.

With them also the exercise of the muscles, and consequently of the whole body, was simply a part of *education*. We find that the Gymnasia of the Greeks, the great models of the science of education, were not only places with sundry ropes, pulleys,

and wooden apparatus, as we recognise them at the present day, but capacious edifices where the philosophers both studied and taught, and the physical and mental divisions of the frame received an equal share of attention. The whole Art of Education was, in fact, embodied in the well-known *later* maxim, *the mens sana in corpore sano—the sound mind in a sound body*. This soundness proceeded from the mutual balancing of the two forces, the physical and the mental, which could alone result from a perfect harmony in the working of the several parts of the frame. And, following out this suggestion, it is curious to observe how the human body exhibits *two* forms of vital exertion necessary to existence:—first, that of the entire muscular apparatus, whether of ordinary muscle, arterial coat, or otherwise; and secondly, that of the various secreting and excreting organs in pursuing their functions. Exercise is common to both; but it differs in degree, and greatly in kind; and these circumstances are well worthy the reader's attention. The two forms may be thus explained. Exercise by muscular movement stimulates the entire network of the circulation and the vital processes* resulting from it, without their being exhausted, but rather benefited thereby; it is, therefore, the *natural* means ordained for the maintenance of general health. Exercise of the various organs of the body, on the contrary, is attended with a considerable expenditure of their powers, and, if beyond a given point, their integrity is overbalanced, and organic disease may slowly follow. In common life the latter is too often the result of one or all of three causes: improper food, neglect of bodily exercise, and injudicious and pertinacious drugging. When these poor organs have by over-exertion become weakly, and their func-

* A minor example of these is given in the earlier development of the teeth of the lower, or movable, jaw.

tions slow and imperfect, repose would seem to be required by them;—but no, the whip and the spur, “the short life and the merry life,”—all these and more preclude anything like a rational treatment of the causes at issue. The public, however, are masters of their own situation; the newspapers supply them abundantly with materials, in the shape of patent medicines; and with these at one moment or other, and the broad eye in which valetudinarians are soon doomed to revolve, it will indeed go hard if they do not ultimately wreck the bark they seek to steer through the common shoals of existence.

But to resume: well might we touch on the condition of the nervous systems of the people of our own and many other countries at the present time. They are indeed highly strung! Yet mental excitation is boundless and increasing. Rapid travelling, cheap and abundant literature—every desire appealed to, every want forestalled! Surely we require no additional loads to be cast upon this nervous system, but we need a better harness for its control and guidance. With us the tendency is to work the mind entirely through the chords of its great instrument the brain, and the sound-mind-in-a-sound-body principle is lost sight of. The end of this one-sided form of education, so to speak, ever is, and can only be, arrest of healthy bodily development. But, alas! it is even more than this, for the mind and body are inseparable, and the harmony of the mischief produced is equally evident with the harmony of the good that might have been produced, were the ancient model more faithfully copied. If to be learned is, even in our own day, to be well acquainted with the thoughts and writings of these ancients, surely it is fair to consider also the grounds of their intellectual excellence, and the system of education upon which that excellence was originally founded.

It is a common mistake to associate the cruelties and barbarities of the ancient Romans in their gladiatorial contests with the system of gymnastics and other means of bodily development derived by them from the ancient Greeks. It is true, however—and we have the authority of Galen for it—that the decline of these measures of health was the result of those revolting spectacles. Nor is an explanation of this so remote as would at first sight appear. A desire to witness the dangers and even destruction of others is usually most prominently exhibited by persons who would be the very last to share in similar perils. Such individuals form the masses of a waning nation, or a decaying people,—a people who have run their cycle through—brought to the verge, the exhaustive verge of their civilisation, where depravity speedily blossoms into cruelty, and cruelty ripens into a full-blown yet unacknowledged ferocity. Failing and lost excitement craves an arena in which are enacted scenes shocking to a healthier sense. And we have already something of this in our day, when men go to see a battle, or a prize-fight, and newspaper correspondents are despatched to chronicle its horrors.

In another important respect, likewise, the Grecian model had been tampered with. The baths of the Grecian gymnasium were attached for the purpose of purification after exercise. In the Grecian idea, also, exercise and bathing went hand-in-hand; in the Roman copy the latter held the chief place. It was especially so at the decline of Roman greatness; when in truth those sad periods arrived in which the Italian youth could no longer be inveigled into the ranks of the army, and the powers of endurance of the Roman soldier were but dreams of the past. We have elsewhere sufficient testimony of the effects of excessive bathing at Rome. So far then the *Grecian* model was the true one. The Greeks had their games,

but no desperate gladiators whose lives were given to the amusement of the hour. In those games the victor was deemed an honour to his country. The healthy body with its healthy mind produced high intellectual achievements both in art and science. The nation absolutely forestalled a considerable portion of the history of the human race, for its impression is still upon the manners of our own age. It is at least fair and just to suppose that, so far as intellectual vigour is concerned, they had solved the great problem, and they made no secret of their plan, which was afterwards so well expressed in the words, "a sound mind in a sound body." Their intellectual greatness was at its height, and they alone seem to have lacked one guiding principle, like that of Christian Faith; so that their aspirations, like their deeds and attainments, were not those by means of which a people may be said to increase in number or influence, or leave anything beyond well-defined and wondrous

"Footprints on the sands of time."

Without such a guiding star (though it be questionable if the great men of the time believed its polytheism,) there could be organised no central heart in the nation; hence proud isolation and internecine warfare were alternately in the ascendant, effectually precluding large territorial acquisitions or more rapid development of resources in population. Thus, so far as the people and their numbers were concerned, when the time came, the once brilliant Greek nation was readily absorbed, and all but its intellectual footsteps blotted out.

Yet, in dealing with this subject, we are constrained to go back to their records; and certainly, in respect of their memory, we act unfairly if we build our academical knowledge on much of their teaching and neglect all but one part of

their system of mental and corporeal development. This old door of medical science has been too long closed, whilst chemistry has bidden fair to usurp all for herself. But it should never have been so ; we need its being open more at this hour than ever before, that is, *if we are to maintain our physical position as a nation; and we must maintain that partly by physical means.* With all our great artistic advances, our annihilation of time and space, the world has not yet produced a people superior in intelligence and intellectual advancement to the ancient Greeks. In the case of Rome, it is truly lamentable to consider to what degrading vices, what insane follies, and mental weaknesses, the neglect of the true principles of health subsequently led the people at large. Then it was that great errors crept into the speculations of physicians concerning the doctrine of Hygiene. First, there was the influence of the celestial bodies on the health, life, and fate of man ;* and secondly, in medicines alone, or in particular medicines, were to be sought antidotes to disease. For truly, the national craving of the lapsing Romans was towards the promised discovery of panaceas for *prolonging life*, without the obligation of renouncing sensual pleasures. Such were the “hands of the gods,” &c., &c. A good deal of the popularity of Aselepiades, in those degenerate times, was due to his supplementing the popular taste by pensile beds and baths instead of active exercises, which he is said to have opposed, although he pledged his long life to habits of a contrary character ; he himself was a great walker.

Yet we may now consider many features in which this important subject suggests itself to us all. Exercise recom-

* So recently as the time of Charles the First, we find a physician of eminence engaged in casting the horoscope of the king's daughter, then languishing in hopeless consumption.

mends itself to us at every period of our existence, from the beginning even unto the end. There is great care too required lest we get too much of it ; either through the entire frame or only a part of it. If a man exercise his brain too much, his muscles and the chief organs of his body too much at the same time, a collapse must ensue, and does ensue—and that too frequently a fatal one. Nervous force is expended by the muscular act and by the intellectual act. Were a man to devote himself entirely to his muscular system, he would be developing a preponderance of his animal nature : the organs of sense would be excited, but the higher operations of the mind would be in abeyance. We might view in such a person all the well-developed graces of manly beauty, in form and material, that met the eye of the Grecian sculptor long ago,—yet it would be a form the more adapted for defence of country, for the demonstrative and practical service of his fellow-men. The latter, however, is no small point for the consideration of statesmen. It is no small point in the histories of those countries which have succumbed to more powerful rivals at distinct periods of time. It is, in truth, no small point with nations so long as international difficulties shall bow to the arbitrament of the sword. It is, in fine, no small point in the healthy character of the people, both as to national enterprise and national morality.

It is certainly a grand thing to say of so apparently simple a matter as bodily exercise, that it is not only what we have already described it to be, but that it is an aid also to the healthy development of the intellectual faculty—the great faculty peculiar to man. Now, this is a view of the question which ever claims our most earnest attention, for so much of human happiness and progress depends upon it. Moderate exercise of the muscles, directly as well as indirectly, gives

force and vigour to the mental faculties ; and when the one is made to balance the other, harmony of action prevails in the system, and there is thus, and thus only, soundness of mind and body. It is not so either with the over-worked or over-developed intellectual faculties. Before these the purely physical forces succumb. This is well known to the observation of most persons ; and the most simple explanation of it is, that the brain, when well worked, is insatiable of nutriment, and that nutriment is derived from the blood, and the most healthy and richest kind of blood too. The frame suffers if this be continued long, and beyond the point which individual inherent power permits in all cases,—and not only the frame, but the mind itself, because of the framework in which it dwells becoming weakly and unsafe. Hence comes the question, is the mind to consider the body at all ?—is not the latter to give way to the free action of the former ? If it be possible, and so far as it be possible, undoubtedly. But the mind cannot ignore its dependence on this framework—this instrument, on which it sounds so many high and exalted notes, none of which we should for a moment desire to lose—and when it snaps string after string, or, as at times, the whole at once, it falls a shattered instrument, never after to be repaired and used. The tendency of the methods of education pursued at the present day, whether as regards male or female youth, is rather, than otherwise, to depress and forestall intellectual vigour, and to diminish those powers which at maturity should be seen in their highest development. When maturity of the body is arrived at, there is too often a dulness of intellect exhibited, and the more strikingly so where there had previously existed a most hopeful youthful precocity. Both in our national and private schools there has been of late years a growing tendency to what is called the “high-pressure system”

of education. This consists in submitting the young scholars of both sexes, at what may not unfairly be called a *tender age*, to those parts of education which, in days gone by, were kept back for a more advanced period of existence. This condition of things is, however, of comparatively so recent origin that the general effects have as yet been too isolated to attract notice.

Such was not the plan either followed or approved by the ancients, for we learn that, after attaining the age of *eighteen*, the Athenian youth were called *ephebi*; and the state of *ephebeia*, as it was called, lasted for two years, till the youths had attained the age of twenty, when they became men, and were permitted to share all the rights and duties of citizens, for which the law did not prescribe a less advanced age. They were examined also as to bodily development amongst other things, and to discover if they were strong enough for the duties of citizens. This, we believe, was not only the case, but youths were not permitted to associate with men till the ages of *sixteen* or *eighteen*, and any amount of serious intellectual education rarely began till a child was arrived at *eight* years of age.

In the Roman law the term *infant* seems to have extended from the period of birth to the end of the *seventh* year; from this time till the end of *twelve* or *fourteen* years, according as the persons were male or female, they were called *impuberes*. At the *twelfth* or *fourteenth* year, unlike the Greek law, either could marry. At that age a Roman youth could assume the *toga virilis*.

Such is the contrast between the Greeks and Romans in respect of their educational and social development—between the great inventors of gymnastics and those who copied while they slighted them. Such is the contrast between the old

Italian and that more ancient nation whose spirituality at this moment impresses the highest mental impulses of *our* age of civilised men: which left the world so many great and enduring legacies. The same Grecian climate, the same Grecian soil, exist now; and who can affirm that the exercise of the great principle involved in the “*mens sana in corpore sano*” would not resuscitate this ancient nation?

“Sad relic of departed worth,
Immortal though no more; though fallen, great.”

Yet, be that as it may, how often in the present day do we not find parents compelled to remove their children from school and studies for several months at a time, in order that they may recover their health; and this either through what they themselves see, or by the advice of their medical attendant. The body being a *unity* suffers in its various functions; there is exhaustion of nerve-material, and with it of nerve-force; depression then seizes upon every link of the chain. This condition is most commonly observed in children of lymphatic temperament, whilst it may probably increase the number of victims to *tubercular* disease. In these cases the constitutional torpor of the lymphatic system may be the proximate cause of the derangement. The well-known anatomical connection between the lymphatic and the venous stream, and its dependent character upon a healthy tone of action of the latter, point this out most strongly. The former requires, in fact, greater impulse than the venous system, for we always find a diseased condition of these important vessels and glands accompanied by extreme inactivity in the patient, owing to the want of external stimulus. That stimulus we observe also to be temporarily produced by sea-air and sea-bathing, the effects of which, however, too frequently subside on return-

ing to old habits. The existence of muscular sacs, called "lymphatic hearts," in certain reptiles and birds whose powers of locomotion are exceedingly restricted, seems also to us to bear well on the view we have taken of the occasional strong impulse demanded by the lymphatic circulation in the human subject. This impulse is shown in the condition of the lymphatics of the lower extremities, for they rarely, if ever, are subject to that serious condition of disease which affects those of the upper extremities, and especially of the neck and throat. *Tubercular* deposit at the same time, traced as it has been throughout the body, may after all have much to do with functional torpidity of the lymphatics. The *lungs* and *liver* are more largely supplied with lymphatics than other organs of the frame, and are constantly liable to temporary derangement and chronic disease, especially after long-continued arterial or venous congestion. They are, moreover, the most powerful agents in *absorption*—the absorption so often demanded in diseased conditions of the body. We find that an organ will be at times almost entirely absorbed,—tissue, vessels, and all; and how are we to account for this, if there be not a more powerful channel than that of the veins? The differences are certainly those of *degree*; and so long as the circulation of arteries, veins, and lymphatics is healthy, so long is the chief source of vital strength in the ascendant. Judicious bodily exercise, therefore, is adapted beyond all other known means to remedy defects of circulation and retarded nerve-force, for the nervous system is itself subject to physical laws, its own healthy physical action at least being in direct proportion to the healthy or diseased condition of the mass of the human framework.

Those who deny the existence of faults in our modern educational system, such as we have already briefly pointed out,

may yet, it is hoped, be induced to consider many shadows of evils to come which already stalk moodily throughout this favoured land. That these shadows come not purely from increase of population, is shown by the fact that the comforts and enjoyments of life, and the very means of existence, are multiplied four-fold by this great increase of population. That they *lengthen* with the increase of population we readily admit. Upon them we see, impressed in the broadest outlines, the well-known ciphers of lunacy, mental mediocrity, youthful precocity in vice, abounding diseases of the nervous tissue, arrest of healthy physical development, and lastly, inferiority of offspring. Those fears which have evoked that great national demonstration, the Volunteer Army of this country, have been, in this respect at least, most providential to our people. It is not “King Muscles” we would exalt and demand fealty to ; it is only that we may, by having a sound body, secure a sound mind also,—*as well as hold our own*.

Then, again, it seems as if we lose our bodily vigour through one of two common processes, which we may call *wear* and *rust*. Exercise, in removing rust, converts it at the same time into material. When active minds and active bodies are united, long life and much public service are the results. Such are the examples shown in some of our leading peers and statesmen. What shall we say of dancing ? Why, that from pole to pole, from one end of the world to the other, people in all time have loved dancing. However civilised, however savage, all have loved dancing. It shakes off a good deal of *rust*. Yet, to shake off rust in general, there should be a certain degree of training gone through. Without this, the process, especially at maturity of existence, is often unsafe. It would often be better to let the rust alone. There are many cases of plethoric individuals and others, where any degree of sudden

heightening of the circulation is attended with danger. The reason for all this is, that the tissues are unhealthy. The tissues have not the ability to bear the weight and pressure of the sudden exertion which follows any great change produced in the circulation throughout the frame. It is evident that persons if not exercised require very little food, and would want less exercise if they were more temperate in eating and drinking. It would possibly be equally conducive to longevity if we took little food and little exercise. Thus we read daily of many old persons, of both sexes, who live to great ages, and who undoubtedly take little food and little exercise. There is no doubt that life may be prolonged, and in some instances successfully, without *active* exertion of any kind; but still there are conditions annexed to this, and they are such as to demand our most earnest attention. If the body be not exercised, it is, in the first place, little fitted to support the common demands of the battle of life, of any unusual or unexpected physical endurance—the latter being the frequent source of insidious organic disease; nor can the natural faculties of the frame be so well developed. The happier circumstances, as they are considered, of some individuals, may render exertion unnecessary, at least for the sake of gaining a livelihood; but persons so situated may rest assured that they possess abbreviated functional powers, and that the resisting faculties of their organisation are proportionately diminished. With less physical power of resisting strain and shock upon the tissues, such persons should avoid sudden excitements or calls upon a frame toned down to its lowest level, and only preserved from disease by the most careful attention to diet and repose, or the heaping of too much fuel on the fire; whilst, where these conditions are thrown aside for the caprices of self-indulgence, mere existence is allotted them, and they are wise if they do not yield to oeca-

sional yearnings for violent physical display. There may be hundreds, and possibly thousands, to whom the latter is annually a cause of incipient organic disease. Let them, therefore, avoid these things, and their dull, inactive lives may be prolonged. We recollect a case which occurred some years ago, of fatal aneurism of the *aorta* through exertion of the above kind.

The contrast, however, is very striking between the foregoing and those to whom exercise or motion appears to be a necessity of existence, brought about by the seemingly less happy circumstances of social position. These enjoy life, and enjoy it longest, for their pursuits are not narrowed by the sole pleasure of eating and drinking, and the like; but they put on a fair proportion of fuel, and they burn the fire briskly, and every function is aided in its work. Again, the dependence of the mind upon the physical health of the body is evidenced, if only by one fact, namely, that nervous irritability diminishes by assiduous perseverance in muscular exercises; and it would be a step in physiology to know how to alter or reduce the excess in either of these two opposing conditions of system. Nevertheless, pursuing the former line of argument, there is no doubt that the *passive* exercise afforded by gestation in carriages is a safety-valve to the morbid results of sloth and indulgence; but it, of course, cannot afford one iota of increase to existing functional power. Yet it doubtless assists the general circulation, for it favours venous and lymphatic absorption to a remarkable degree, as we have said already; and this is one of the chief causes of its apparent all-sufficiency with those classes of persons who are either unable or unwilling to assist Dame Nature in a more hopeful degree. With great moderation and care in diet, and this partial exercise, individuals may safely attain, in many instances, to a very

advanced age: but it is an automatic form of existence, endangered by every vicissitude of clime and season, rendered painfully susceptible of every casual emotional impulse, and more keenly alive to the dangers rather than the pleasures of the external world.

But let us consider this frail sensitive condition of the unexercised person. What is it, and what may be said to be the standard of health? The latter is purely an arbitrary thing; it is like the subject of *longevity*, disquisitions on which we have long learnt are of no real service to mankind. Men observe that the inactivity and abstinence of the ascetic, both physical and sensual, lead to premature old age. They find likewise that those who have enjoyed life have generally enjoyed it longest. The child sleeps and vegetates; the boy runs wild; the man reaps the harvest of his animal functions; the old man is calm, selfish, and self-indulgent. With the latter alone, longevity may be an interesting subject; but it is too late: the hour is gone by! It was the jocular remark of a legal dignitary, when questioned on this point, that "his only exercise was eating and drinking." But mark the moral of this reply, because a good deal depends upon it. It appears, at the first glance, to be a capital case for those who habitually dislike exercise. It is, however, a most decided and conclusive instance of the fact, that the subject of longevity is a slighted subject. It is only a proof (supposing it a fair one) that there are conditions of body which account both for the necessity of exercise and the ability to do without it—either of which are not considered as they should be. But if we fail in indicating clearly the true standard of health, we have less difficulty in declaring that the host of "nervous" affections increasing yearly among the people of this country, may be due to over-tasking of the brain, and the habitual neglect of the general

balance-weight, namely, active muscular exertion. At the same time it is evident, as exhibited in the experience of all time, that the powers of the brain to sustain for long the various degrees of intellectual exertion are in direct proportion to the physical health of the body, that is, so far as resulting nervous diseases—as they are called—are concerned. To make use of a very simple explanation, we may say that the nerves could not be so speedily jarred and upset as they are in the majority of persons, if there existed even the ordinary amount of physical health, such as would enable these nerve-chords to vibrate with deeper and more powerful tone. There are still, ever have been, and will be, great intellects in weakly bodies, which sustain their vigour in spite of the want of balance before-mentioned. But this pre-eminence is confined to the efforts of the intellect entirely—to the things of the mind, in fact—for these highly-gifted beings rarely escape the nerve-havoc, so to speak, of every-day existence. They furnish, indeed, from their high position, the most remarkable examples of the frailties and infirmities of our nature. If they, however, are notable marks for those shafts of ridicule and morbid feeling which it pleases so many persons, in every age, to level unsparingly at the shortcomings of humanity, how are we to deal with that numerous class which possesses a nerve-power unequal to a high degree of mental or physical exertion and development? Are we to sit down contented with the mere vulgar belief that in the latter instance it is mere “nervousness,” and, as such, a condition incapable of amelioration? The sufferers are themselves prone to do so. Yet any concurrence with this view would be tantamount to an acknowledgment that the health of the nerves—and health of nerves and strength are almost one and the same thing—is a matter *apart* from those principles which govern the health of the

entire frame. The medicine suitable for this condition is universal physical improvement, and there is rarely to be found a sufferer entirely incapacitated for the trial. If left to themselves, however, people thus afflicted will never make any effort, but remain the opprobria of their species. Exercise, in truth, whatever its nature, is not an affair of now and then ; with the majority of persons it may be so, and thus it is made to bear the stigma of inducing organic disease, even with and among professional men ; nor is there any frame to which, if need be, it may not be applied.

Its application is an art surely not unworthy of the times in which we live. Among men it may be often "more honoured in the breach than the observance ;" still it may preserve many a frame, and remove a good deal of the acerbity and irrationality which frequently embitter both political and social life. But to gain the confidence of the public it must be enforced as *a truth*, upon the ground which the great Sydenham held, when, after thirty-four years' martyrdom, he declared it to be absolutely indispensable in the treatment of *gout*, and that "no excellent and effectual remedy had been anywhere experienced which had not received its chiefest virtues from the aid of muscular action." It is an axiom also furnished by experience, that *too little exercise is as bad as too much*. And this leads us to glance at the great principle of *moderation* in all things, by which human life is prolonged, and that with comfort to the end. What were the secrets of those two remarkable men, Old Parr and Jennings the Yorkshireman, the former living to the age of 153, and the latter to that of 169 ! Old Parr was a simple labourer ; and the declaration of the celebrated Harvey, who examined his body after death, was, in few words, that he might and ought to have lived longer. His death was evidently brought about by no disease, but by change of fare, by the rich

diet of the court of Charles, which, by making a too powerful call upon the digestive and other functions of his body, rapidly consumed his small remaining vitality. It would have been otherwise had he adhered to his country fare. Thus it was that Jennings surpassed him as to length of days. One hundred and sixty-nine years! It is an incredible age, and we begin sometimes to doubt if it be a genuine occurrence. We have so little history, or in fact no history of this latter person, that had Old Parr never lived we might well be justified in disbelieving his existence altogether. But he was, it appears, an old soldier and a true man, and died during the year 1670. Imagine all the generations of men and events which crowded and passed on, strutted their brief yet important hour on life's stage between 1501 and 1670, the century and two-thirds comprised in the existence of one person!

It is exactly, owing to the degeneration of tissues to which we have already referred, three average lives! How much, then, is it to be regretted that we know so little of this singular person, save that in early life he had been a soldier, subsequently a fisherman, and when that failed, with failing powers, a beggar. The motto of his existence was "temperance, labour, and a mind-at-ease." His diet, we are told, was "coarse and sour," and that is the extent of our information. If Old Parr worked as a farm-labourer when he was 120, surely Jennings displayed at the same period of his life equal activity. Indeed, the sources of health were spread throughout his career—the enforced temperance, the still more necessary labour; but the mind-at-ease, what shall we say of the latter? Did the secret of his long, marvellously long life reside there? To a great extent it did undoubtedly. The mind-at-ease was a proof of a healthy condition of the nervous system, and the latter in its turn was a guarantee of the general functions of the frame

being healthy and true; thus the "*mens sana in corpore sano*" was established and maintained.

When Death, the King of Terrors as he is called by some, is represented with a dart, mankind is practising upon itself a species of the grossest deception. That imaginary personage is no aggressor, but merely attends our bidding. The majority of men are deeply and earnestly engaged in "digging their graves with their teeth," and when we calculate that three simple meals a-day in the course of *one year* only, will put our singularly complicated digestive functions strongly to the test for one thousand and ninety-five times, we can readily comprehend the nature of this popular performance. Besides these there are all the little additional delving efforts which the customs of society give rise to in the course of the day, and it is a most happy thing, if only on this head, that sleep has been granted to man, that he may, for some hours at least, rest from these sepulchral operations. The length of time also which is occupied in sinking and enlarging the area of the before-mentioned all-interesting parallelogram depends as much, or more, upon constitutional power as upon the vigour with which the pursuit is followed up. Men have various paces at this digging, but they arrive at last at the same goal.

The phenomena attending "muscular atrophy," or shrivelling of the muscular tissue, are in many cases widely different from those of the atrophy of simple inertness or obstruction to motion—between the muscle that is worn out and that which is debarred its active functions. There is a paralysis and wasting through inaction, just as there may be an atrophy from over-exertion; and on the contrary, a degree of temporary hypertrophy or muscular enlargement to a painful extent from the latter cause, only to be removed by repose, pressure,

and gentle friction. As to excess of exercise, it is unhappily too patent that men are literally worked to death: but this is *work*, the drudgery which forms one of the attributes of so-called civilisation. That almost superhuman toil which permits of no repair of tissue, and beyond that, the gradual and sure wasting of the inherent vital powers to support the labour of the moment, accumulating with the very demands of existence, constant and unremitting, impoverishing every element of constitutional vigour, is not *exercise* in its remotest sense,—it is physical immolation. There is pressure, tearing, and violent straining, as it were, of every tissue and function.

Yet the body does not *wear* out from mere motion because of this consentaneous action of every part, for that which is apparently external motion influences the internal, just as, by way of assisting the action of medicines, many physicians recommend active exercise. How great an aid to medicine such a prescription often is must be well known at the haunts of the dyspeptic, the home or continental watering-places, and needs enforcement everywhere. There is undoubtedly a husbanding of the internal impulses of the body through moderate *active* movements; indeed, with this *daily* accessory to our healthy duties, *age*, as we have said before, is a purely *relative* thing. It was to give the substance of his authority to the latter rule that Asclepiades, the veteran physician of ancient Rome, boasted he should not die of old age. The modern physician might well imitate him by performing at least some portion of his “rounds” on foot, and we might then possibly hear less of heart disease in this and other quarters. Active motion, so far as the human body is concerned, is essentially that of its own organs or parts; and this applies not only to general healthy tone, but to the

development of the muscular or other contractile tissues, by which life is actually maintained in those working organs or parts.

The old men of Greece, as we have also said already, exercised "to ward off old age;" and although we have daily examples of men of inactive muscular life attaining to length of years, still we have rarely an instance of their so doing without sustaining the "warnings" of decay in the shape of an almost premature loss of one or more of the principal functions of sense or sensation.

Restoration and maintenance of the body depend on our reaching the active condition by slow and gradual steps, pausing as often in the process as nature gives us the hint so to do. Moderation with constancy is essentially the rule of active exertion; for it is ever found that the unexercised "good liver," such as the absorbed man of business, is necessitated to his good living and stimuli, and he would not be in comfort without them; but it is equally a fact that the more physical exertion is used the less internal stimuli are needed, and that the latter do and even should decrease in the ratio of increased activity. In warm climates, people exist without much exercise; but both conditions are apparent enough in the two matters of food and climate, mainly connected as they are with animal heat, augmented skin function, and therefore more active external circulation. In colder climates there is, of course, greater force required to disintegrate the animal tissues, to generate warmth, and the like. Savages, without stimulating food, are in a state of perpetual training; whilst choleric civilised persons, or those in a condition which is subject to defects in the equalisation of the circulation, suffer no doubt from sudden and unaccustomed physical efforts, and Hippocrates forbade such persons wrestling, or even using friction.

There is good ground for believing that much may at a future time be done to remedy or relieve some forms of heart disease, especially where the latter has been induced by too much internal stimulus, with a proportionate neglect of proper external or general stimulus. The heart may be relieved of its struggles to maintain the circulation, and improvement may be gradually effected by external friction applied to the entire surface of the body, then passive motion, and lastly active motion. With care and judgment much might possibly be accomplished in this way. But of this we have not yet sufficient experience.

Most remarkable too are the effects of active motion in old rheumatic-gouty concretions of the joints. We have abundant modern authority, as well as that furnished in this work, for this; and the writer can himself bring some practical testimony to the point. Sydenham made use of this expression, though in a somewhat different sense, "want of exercise withers the body, and *dregs (such as in gout) are laid up.*" The celebrated John Hunter wrote a complimentary letter to Pugh, when the latter published, in 1792, his rare and beautifully-illustrated treatise on "The Utility of the Science of Muscular Action for restoring the Power of the Limbs," in which these words occur:—"I have a good opinion of exercise, as in many cases it may be said to finish where the healing art had done its utmost. I regret very much that your art is not more generally known and practised." What indeed is to be done, we may well ask, with all the cases of muscular debility and contractions after acute attacks of rheumatic arthritis? So far as the sufferer is concerned, recreative exercise is out of the question; it remains that he be operated upon by another. Or should he make the attempt, the locally-affected parts have their pains considerably increased, and consequently he feels that he can derive no

benefit from the process. This is the somewhat natural reasoning of the patient, or it is an unalterable view taken by him in defiance of fact and argument. Hence his entire time is devoted to wheeling-chairs or crutches, and the vain hope of amelioration of his condition sought in *passive* exercise solely. Without such active appliances, people may remain crippled to the end of their lives; and, although they may derive temporary benefit from general treatment, there ever remains the *nidus*, where fresh deposit stores itself in future attacks. The argument in favour of movement hinges on the circumstance that we thus artificially assist the body in throwing off its trammels, and spare it those exhausting functional efforts which we frequently observe in certain conditions of disease. This is the use of exercise, *in its place*. The random efforts of the sufferer oftentimes do little good, and occasionally increase the debility. On the contrary, when the crippled person is submitted to such artificial appliances as passive and active motion, rubbing, &c., nature is assisted—no obstructions can long stand against them, and if by their means a cure is effected, it is in every respect permanent. The muscular system is so much concerned in the movements both of fluids and solids that these motions of the animal machine serve to obey the requirements of the body.

That there is active derivation of blood by muscular contractions may be known by a very simple experiment. If we put one leg, the rest of the body being in a state of repose, into strong action, the other leg will be found to have its heat and circulation sensibly augmented; and again, on exercising the latter limb the one previously exercised will experience a still higher augmentation of circulation and heat. One and the same form of motion is obviously of no more use in a variety of cases than one specific medicine would be. In a

general sense muscular motion keeps up a degree of equilibrium ; but, though general exercise to the whole body may, if very diffusive, remove *local* congestion, yet in many cases it cannot do it, and in some it will increase it. The latter are of course diseased conditions against which we should be on our guard ; and which if not attended to may bring the use of exercise into discredit. For example, the strongest kind of exercise, especially running, throws the blood as it were faster upon the lungs than it can be disposed of by the strongest respiratory efforts ; and in this instance serious organic mischief is often occasioned to unexercised people,—aneurisms, and hypertrophies or enlargements of tissues resulting therefrom.

To the foregoing we must add another grand necessity of our existence, namely, *repose*. This generally merges in the only condition with which we are partially acquainted, and that is *sleep*. For the sake of illustration we can perhaps find no better example in nature. Yet the analogies of nature do not tell us in unmistakable language that sleep is entirely, in its common acceptance, a means for the repair of tissue, whether nervous or otherwise, but rather for the repose of *organic* and *chemical functions* of the body, and saving of nervous tissue and force. In sleep a mere consciousness of existence seems to be almost the sole function suppressed. Sleep is the faculty with which we renew, or are at least supposed to do so, the vital energy exhausted during the day ; though it be so much dependent on the nature of the hour, on habit, the darkness of the night time, and absence of the daily stimulus to the nerves of special sense. Some of the brute creation may, as we know, be artificially driven by sudden darkness to seek repose. It would evidence that if there be a paramount function which demands its periods of repose, and can in no wise dispense with

them, it is that of the nervous system. And yet there are marvellous cases on record of persons who have lived long, and apparently in health, without sleep; and still more strange conditions of body, debilitated as it may be, where sleep is either partially or wholly banished, and that too for considerable periods. The involuntary action of various portions of the human framework, such as for example the heart and lungs, which produce no perceptible fatigue, and the fatigue of volition implied in mental and bodily exertion, afford marked distinctions on which we need not dwell, for they are well known to physiologists. Therefore it appears that there must also be conditions which necessitate repose beyond the mere requirements of the nervous system, so far as the effect of external stimulus during our waking hours is concerned. Sensations of fatigue and inclination to sleep follow in most persons a condition diametrically opposed to intellectual exhaustion, and are peculiarly prominent in the habits of the lower kinds of animals. It merges almost into a matter of mechanical supply and demand. Granted that the heart does not require repose, the bodily functions fed by it do; and therefore (if we may take up common-place reasoning in so recondite a matter) it would overfeed the various tissues, as well as overload the various organs, if it were continually working at the same pressure. As there may be bodily necessity in the intermittent heart and pulse of old or weakly people, so there is still more obvious necessity for the horizontal posture in sleep, and the induced slow action of that organ. It may not with safety pump night and day at the same pressure, both as regards the expenditure of vital force and the over-induced chemical action of the blood; but it may be, and most probably is in certain cases, required to pump night and day on the latter account with the same vigour, to

sustain life. This is the only cause one can assign for the sleeplessness of overworked brains, for the local determinations of blood induced by the nervous system, and for the absence of repose of the circulation which the wear and tear of that system produce in individual cases. Sleep or repose is not confined, in the language of the poet, to those examples "where fortune smiles;" nervous excitability must be dormant for complete sleep, for while the brain is in action the bodily functions must be at its command. An active brain, unlike an active body, cannot work off any excess of blood supply, and we instinctively rely on the muscular tissue to favour the restoration of the lost balance. Above all systems of our framework the nervous is the most disposed to this nice discriminating balance, and appreciates more potently than the others any excess or diminution of the ordinary exercise of its function. Any break in the harmony of its working, any prolonged impression upon its individual vital chords, is followed, temporarily or permanently, by an entire and complete disruption of that harmony. Yet this is an occurrence seldom witnessed in the less noble functions of our framework. They bear the "accidents of existence" with a stoical fortitude, and respond oftentimes with accelerated and accumulated powers even to our excesses. Repose would consequently, in common language, be the result of "supply keeping pace with demand," both for the organic and chemical functions of the body, and is therefore an absolute and a *relative* thing.

The latter is essentially the practical point in relation to the muscular and other contractile tissues of the body. With them every active function is associated, not omitting that of the nervous tissue, which depends for its health upon cardiac and arterial vigour—in other words, on the adequate supply of blood. Whether, therefore, we use *friction*, *active* or even

passive motion, there is a due amount of alternating repose demanded. Friction, as a means of excitation, especially exemplifies this, by the amount of irritation produced when ineautiously prolonged at any one period of application; a circumstance due to exaltation or excitement of the extreme branches or loops of the nervous tissue. *Active motion* in its use, exciting as it does the vast arterial network of the frame, as well as favouring venous and lymphatic absorption, has long been self-evident, both in augmentation of bulk and physical power, and the necessary disintegration of effete tissues, giving place to fresh structures, without which process health can hardly be maintained. Hence the products of bodily activity are so obvious in their results, and so little heeded (we are sorry to add) in the investigation of the causes of numerous forms of chronic and organic disease. It need scarcely be urged by us, except to those unacquainted with the broad principles of human physiology, that rapid degeneration of tissues is almost unknown where bodily activity is the uninterrupted habit of the frame.

Again, undue repose does not produce harm by mere relaxation of the tissues, but by the disorganisation that ensues, such as by deposition, in excess, of the lowly organised products oil and fat, in the place of firm muscular fibre. It is not in one portion of the body only that this takes place, not simply in ordinary muscular tissue, but in every portion of the frame alike; in every part, in fact, that is capable of motion during its performance of some function or other of the body. Here lies the danger of excessive tissue-straining consequent on previous unaccustomed exertion. No tissue can be deemed safe from the effects of such a trial, whilst it would be equally impossible to determine what part would or would not give way. The Greeks and Romans, in their gymnasia,

seem to have been fully alive to these conditions attached to exercise.

The presence of organic diseases, however, is not confined to the higher classes of society, but rather to the lower, as our large metropolitan hospitals can well testify. Yet, on investigating the matter, we are glad to find that the records of these cases are in favour of moderate and healthy exercise. The most frequent are those occurring among mechanics and artisans, whose lives are spent very differently from those of persons residing out of the towns—free from the bad air, bad food, and abundant vices of cities. It has been correctly affirmed that drunkenness is rather the effect than the cause of poverty; and the truth of this is painfully evident, in the instance of the town mechanic especially. Not only poverty, but want of healthy mental relaxation and amusement, are the means which furnish the tap-room, or the public-house parlour, with its nightly throng of victims. The adequate supply of solid food, likewise, is either forestalled, or its equivalent supplied, in large and repeated administration of the hydrocarbons—the spirituous and fermented liquors, as they are styled, often drugged and concocted of the vilest materials. This habit of the lower classes—and, we fear, of many of the upper classes also—is not confined to these islands, but may be observed in Germany, Italy, France, and some other countries, whose boast it has long been that their populations are not prone to such practices. Thus, there can be little difficulty in foreseeing the chances of organic disease of tissue in this general impoverishment of the body. Abundantly serving, as these “hydrocarbons” do, for respiratory material, they are, by the necessitated exercise of this class of persons, disarmed of half their dangers; whilst, in the case of individuals of the upper or more indolent classes, unless they drink with moderation, if

disruption of tissue do not follow some unusual exertion, the vital functions, brought to their lowest ebb, gradually yield to increasing want of tone, and premature decay speedily perfects its work. Surely we are justified in drawing conclusions of this nature, when we consider how few persons, in all countries, really die of "the calm decay of age."

The foregoing principles apply, without exception, to the various uses of artificial exercises,—whether, as described in this work, in the form of medical gymnastics, or in frictions, or other local manipulations or movements. Short periods of repose are necessary for their physiological effects, in adequate proportion to the periods of exertion, or we obviously lose the benefit of them. But we experience even more than this. The tissues so operated upon are, according to the circumstances already related, either weakly or insufficiently nourished; and thus two points demand our attention. The first is the danger of disruption, and the second the possibility of using up too rapidly the small amount of vital force contained in these tissues. The object should be to educate the part till it arrive at a proper degree of healthy local action, and this can only be done by slow degrees, by beginning at a point, in fact, and allowing ordinary nutrition to generate gradually the materials of that force. The difficulty would seem to be to get over patiently the first lessons or the intermediate steps, conditions which ordinarily give so little promise in the beginning; for it is surprising how impatient we all are at that which demands *time* to be given up to it. Nevertheless, this *time* so given is as nothing where the actual maintenance of existence is concerned. What a catalogue of evils, then, without overstraining our facts, may be found to spring from a neglect of all this! Those evils are dormant and unfelt whilst a judicious avoidance of sudden effort in the unexercised body

is maintained ; on the other hand, how many incurable afflictions may spring from these sudden efforts ! With the disruptions consequent upon them it would seem that repose is of no after avail, at least in nine cases out of ten ; slowly, silently, and secretly does the organic mischief proceed ; trifling at first, warning but by faint degrees, till it be matured and ripened. This, in fine, foreshadows the great uses of daily exercise, and the consequences of undue repose. With extreme care and caution, such as few will accord it, the bodily frame may exist free from disease without exercise ; but it must be borne in mind that it can equally exist without this care and caution where exercise is habitually taken. The latter is the great gain of the high principle sought to be encouraged and made popular in the following pages. It ought not to be a *questio vexata*—but a truth, adapted to all persons and all times, modified alone by the circumstances, habits of life, and necessities of the various members of the human family.

CHAPTER II.

The Treatment of Disease in the earliest Ages of the World—Origin of Medical Gymnastics—Characteristics of the ancient Gymnasium.

WE gather from the earlier histories of medical science that before the knowledge of *medicines* had advanced to any great extent bodily exercise occupied a considerable portion of the attention both of physicians and legislators, whilst the former recognised it as a branch of their art, under the designation of “Conservative Medicine.”

It was on this account that the first physician who practised it in conjunction with his art adopted the system. This was Herodicus, surnamed for that reason the *Gymnastic*, a native of Selymbria, a town in Thrace, and subsequently one at least of the instructors of the renowned Hippocrates. These two physicians judged it to be as much the physician's duty to provide against diseases in the healthy man as to cure him who was already attacked. Hence they rendered the science prolific of good, giving it thus an intimate relationship not only with sickness but with the health of the bodies of men. Hippocrates, however, very properly censures Herodicus on some occasions for extreme views in this matter—in truth, for departing from the common precautions of medical science, by destroying some of his sick patients who were in conditions diametrically opposed to the use of bodily exercises of any kind. So the former judged that the physician's more immediate duties related to the curing of disease, and thus it was that the collateral portion

of the work fell into the hands of less-instructed persons, and, as a natural consequence, to all the abuses which have followed from the remotest periods. Whatever absurdities Herodicus may have been guilty of in his enthusiasm for the cause of bodily exercise as a healing process, none could be greater than resulted from the "spontaneous records" of the sick, as they are called, which, after the days of Hippocrates even up to the age of the Roman Emperor Antoninus, disfigured the walls of the temple of Æsculapius. These records were nevertheless instituted by the immortal Hippocrates for the wisest and most beneficent of purposes; and his own regulation, by which these tablets bore upon them the simple history and experience of the sufferer, without the comment of the physician, is a lasting monument of his lofty and practical mind. Through him medicine rose by rational rules to the dignity of an art.

It was, indeed, many ages after that profound reasoner had passed away that the "spontaneous records" assumed the characters of absurdity and fanaticism. It was during and about the time of Antoninus that miracles were performed at the altar of this god; that the blind regained their sight by touching the altar simply; that pain in the side disappeared by means of a cinder from the altar dipped in wine; that vomiting of blood was stayed through eating the apples of pines taken from the altar, one mixed with honey being consumed daily for three days; and that sight in another instance was regained by the blood of a white fowl mixed with honey, applied as a collyrium. These were mere vulgar errors, such as are of no particular age or country. On the contrary, the ancients were wise enough speedily to note the advancement and propagation of diseases resulting from idleness and incredible self-indulgence, and the chronic and incurable character of many of them; so as to cause them equally to devise

means for remedying these defects, amongst which we learn that, after the age of Hippocrates, both boys and women exercised for the *gout*. Even in the time of Pliny we are told that they were born with sealy eruptions, and were fretful, siekly, and potbellied. It is certain also that several frightful modern diseases were equally well known to physieians of those times as they are to our own.

So it is that, to the honour of Hippocrates and his followers, we have these two divisions, the one known as *prophylactics* or matters of *hygiene*, and the other as *therapeutics* or the application of remedies to cure disease, which exist at the present hour. Whilst also the *curative* takes properly the highest place in medicine, the *conservative*, as an adjunct to it, is no less necessary to the perfection of the science that disposes of our lives and our persons. The Emperor Julian did honour both to medical science and himself, when he made his famous declaration in its favour, proclaiming not only its "obviously divine origin from its success," but "its power and virtues in all future ages over the maladies which afflict mankind." And we are here constrained to put on record a recent, though no less famous, declaration of the present Lord Chief Justice Cockburn, in the well-known trial of *Symm v. Fraser & Andrews*, touching the position the practitioners of medicine deserve to occupy with the public generally. The Lord Chief Justice, in summing up, said, "this case was one of very great importance, involving as it did the question how far medical men, acting honestly and to the best of their judgment for the good of their patients, were responsible; and the jury ought to be careful not to impair the efficacy of medical assistance by exposing medical practitioners to be harassed by vexatious actions."

We are now led to consider what is in truth the special duty

of this work, namely, the explaining of all that is comprehended by the expression *conservative medicine*. To attain this, we must not only bring forward all that modern and mediæval research affords us, but go back to the remotest records of antiquity; for these points have been strictly attended to, more or less, during every period of man's history upon the globe he inhabits.

Conservative Medicine or Hygiene may be said to possess three special qualities, namely, the *prophylactic*, which comprises any means made use of to prevent disease; the *preservative*, if it may be so called, which maintains present health; and the *analeptic*, that which recruits or recovers strength lost by sickness. To secure these advantages there appears to have been in ancient times an almost incredible number of appliances, which were deemed guardians of health, and known under various designations. There were the *extrinsic* and *intrinsic*, the former related to all those methods which favoured the various excretory functions of the body, combined with external applications, such as of "falling water," of "air," and "salt-liquor" or "sea-water;" and in the latter example to those regulations of internal forces which are implied by the word itself. So that in ancient as well as in modern times, all that relates to medical measures in respect of quantity, quality, and suitableness has been already copiously treated. It is not so, however, with regard to the laws of gymnastics or bodily exercises; for the gymnastic art, so greatly celebrated in ancient times, was both originated and perfected by the ancients. Still, notwithstanding the abundant references to these practices, which are to be found among both Greek and Latin authors, we have no treatise or system of exercises handed down to us. That such treatises were composed, we have every reason to believe, and that they perished with the physical and intelle-

tual vigour of the countries which gave them birth is more than probable. To Galen we might have looked for at least some sketch of the history of this excellent art, had not the vicious and cruel practices of the Arena, which sprung from them and marked degenerate Rome, both disgusted and appalled that distinguished and renowned physician. By way of proof that this is no light affair, where the qualities of defence as well as vigorous enterprise are concerned, we may instance the fact, that the Roman power, from this and other causes, gradually fell to pieces, at the very period when the Roman youth would no longer enter the ranks of the army, and the animal courage of the nation became extinguished. And yet public writers then, one and all, bear witness to the value of the art of exercise in averting future diseases, preserving present health, and revigorating convalescents!

At the risk therefore of prolixity, we propose to gather together in this volume, all that can be gleaned of gymnastics themselves in the works of the ancients. This will serve to show their invention, increase, and perfection, the manner of using them as to quantity, quality, and circumstance, and indeed what is the advantage or the injury to be expected from every kind of exercise. We trust likewise that nothing which it is possible to bring into this treatise will be found omitted, so that the national importance of this subject will commend itself fully to the reader's attention. How much it is honoured in the breach rather than in the observance will not the testimony of physicians of all ages prove? How much also is to be claimed for exercise? The healthy circulation of the blood, the more complete nourishment of the tissues, the more perfect removal of effete matters, of redundances both of the fluids and the solids, the firmness and vigour of the frame, the augmentation of animal heat, and

lastly the exaltation of every intellectual or emotional function of the brain and nervous system generally. Hence it was that the Athenians not undeservedly consecrated the Gymnasium to Apollo, meaning, according to Plutarch, that it is to that god we owe the gift of health, of good habit of body, and of strength. Xenophon tells us that Cyrus estimated so highly the exercises and labours of the body, that he caused the Persians to study to use them rightly, which may be partly implied by the law of that time, that no one should take food without he himself had laboured for it. Hence it was that exercise became as necessary for health and strength as food; indeed, one modern writer has asserted, that he did not know which was the most necessary to the body,—food or exercise. The ancient lawgiver Solon pronounced in its favour, declaring that it seemed to supply something to the human body, just as in purging the wheat by fanning it, the empty chaff is scattered and removed by the wind, whilst the pure fruit or seed is separated and accumulated. And according to Stobæus it was a saying of Diogenes that it was the wisdom, not the sorcery of Medea, that, dealing with the soft and effeminate bodies of men, strengthened them by gymnastic exercises, and restored them to robustness and vigour. Whence her fame went abroad that she had the power of restoring in the old and worn the ripeness of youth. This reminds one of the Duke de Richelieu of the last century, who protracted a life of the most consummate and unexampled profligacy to the age of ninety-two, and who, from his exceeding tact in concealing the ravages of time, was, even in a period so recent, believed to possess the secret of perpetuating existence at will!

In defining what Gymnastics really were, it may be stated that they embraced the whole faculty of preserving health, and not one of them could be reasonably denied to the healthy

person. From the modes of expression of the ancient writers, we judge that though gymnastics were invented later than medicine, they were yet reasonably annexed to the latter. Galen describes the former as the faculty of all known exercises, or the gymnastic art to be the knowledge of the power of all exercises. And here it is to be observed that this was not the opinion of Galen only, but of many other writers, who received it in the belief that no work of science should be excluded from the domains of science in general.

It will be seen also that Galen made a wide distinction between the art of the gymnast and the pædotribe,—as we would wish to call the latter, for the sake of clearness and simplicity. We learn that during the time of Marcus Aurelius, the designs and qualities of exercises were under public inspection, and the public teachers of these were ordered to be selected from the gymnasium, owing to their superior knowledge and experience of what were judged by the different authorities on exercise to promote health and a good habit of body. But the pædotribe, who was doubtless a similar person to our modern “trainer,” demonstrated how these things should be done after a fashion of his own; nor was he so honest or useful as our modern “trainer.” Polybius has explained this to the effect that the pædotribe taught “laws of prevarication,” to make an injury appear fair, to deceive, to steal, to rob, and to employ one’s skill very basely. So that if one estimated the actions of wrestlers or others educated by the pædotribes they will be found to agree with what Polybius has said of them, thus showing that they and the gymnasts were not a little dissimilar. Nevertheless, as they both received pay for their services, the two parties were mixed up in the same way as the office of soldier and Emperor was combined. It was also the wish of Galen that they should be kept perfectly distinct,

because gymnastics implied not only a proper knowledge of exercises, but were altogether more noble in practice.

We have already said that the special study of the *pædotribes* was of an ignoble character, though it may be said in their favour that one or more of their practices were speculative, watchful, crafty, and practical, turning upon the one generic name of *Gymnastics*, just as the surroundings of *pharmaceutics* are called by one name. The speculative and practical parts of medicine are often placed under the one designation, just as Aristotle declares that in all arts and sciences it is necessary to consider not only that which relates to the part but which surrounds the whole. It is also necessary to find out what exercises of the body suit some persons, and what are the best for certain individuals, so as to adapt and strengthen the natural habit of the body. This is *gymnastics*. Moreover the *pædotribe* could equally develop the body, although few persons doubtless ever desired the strength and skill, and we may add the superabundant animal propensities too, which were requisite for the public contests. It is clear that both Aristotle and Galen carefully distinguish *gymnastics* from the art of the *pædotribe*. There was still a certain connection between the two; for all the games of the ancients—as of the Greeks and Romans, of the whole body of *athletæ*, exercises for the sake of fighting or war,—all these bore reference to other forms of exercises. Amongst these, as we shall endeavour to show, there were what were called *medical gymnastics*, manifestly taking a separate place among the appointed exercises. These, notwithstanding, differed very considerably, and these differences arose from no other causes than the ends and intentions by which their several properties were distinguished. The “Games,” on the contrary, had a distinctly religious object,—that they might

gratify as well as propitiate the gods. They were also the delight of the people, and were equally famous under Republics, Kings, and Emperors, under whom a participation in them was held by men in general as highly honourable. Pliny affirms that there was so much honour paid to those who appeared in these games, that when they entered the arena they were received by the audience standing-up, as was the ease in the Senate, where they enjoyed the right of sitting next the senators; whilst themselves, their fathers and grand-fathers were free from all gifts and taxes. The latter we believe to have been granted at least whilst they served or were employed in similar games. That whoever chose might learn these games is a fact to be drawn from the work of Panvinius of Verona, one of the most diligent as well as the most conversant with history of any person in the sixteenth century.

The athlete was so trained that he might, by the very highest display of his own intrinsic powers, succeed in conquering his adversary, and gain the customary crown and reward of victors. Among the Greeks and Latins no one is called *athlete* but such as followed these games and strove for the first prize in them, all of which are fully explained by Galen under the designation vicious or depraved (*vitiosæ*) gymnasties. Yet the *soldiers* studied these exercises for war-like purposes, trying their powers with others in order to compare their skill and agility, so that whenever opportunity served they might be able to conquer their enemies in fight; and they went through a severe discipline with the greater portion of these exercises.

The system of *training* for boxers and runners in our own day is somewhat different to this, as the object is chiefly muscular development, which is brought about, while these

men are in training, in the most simple manner, and according to the strict rules of living on which true health depends. If any valetudinarian would submit to a six months' training he would probably astonish himself and former fellow-sufferers at the end of that period. After the first "feverishness" of training, as it is called, the individual begins to feel himself a new man, not only with gradually improving physical powers, but with those of endurance, and resistance of the assaults of disease—all augmented. It is *now* well known that the "exercise and feeding" is better than the old "purg-ing and sweating." Even Jackson, the trainer, mentioned in Sir C. Sinclair's Work,* confirms the above, but adds that more caution is required in treating *gentlemen*, who he said were really *weaker* than labourers. The latter has received frequent corroboration; and perhaps the most melancholy proof recently furnished us has been by the late Australian Exploring Expedition, under the lamented Burke and Wills. The only survivor of the party which successfully crossed for the first time the great Australian Continent, was King, a labouring man, and one who had from his early years gained his livelihood by his muscular system. Jackson states also, that the only thing his pupils suffered from at first was this little *feverishness*—exercise always at first creating a little thirst. They were stronger in health after training, and not so liable to disease. He deemed exercise and attention to proper food as far more important than purging and sweating, though the latter might be rendered serviceable. Training, he believed, and there is good ground for such belief, would be most likely to do good in *gout*, and even *consumption*. Vegetables should be used sparingly. Persons when trained are generally of costive habit, but that is not

* Code of Health.

to be objected to. There should be moderation in the amount of fluids taken during the day, as it encourages soft relaxed flesh, distending the venous system in fact. If a muscular man in training gets much thinner his exercise should be reduced, but if "fuller," it is a proof it agrees with him. Nervous disorders are always prevented by it. These disorders are never seen in a trained person. There never was an instance, so it is stated, of a trained person being palsied or paralytic. Indeed boxers both now and formerly have lived to a great age, though many have died young, owing to excesses of all sorts. By training, he declares, the mental faculties are also improved, the "attention is more ready," the perceptions more acute, all of which he attributes to better digestion. Animal food is necessary for great strength. In short, the lungs and "wind" improve, and the rich clearness of skin becomes the criterion of "condition." A man feels himself light and corky.

Galen began life as a gymnasiarch or superintendent of a company of gladiators, but it was Pythagoras, a governor also of a gymnasium, who first varied the animal food, because he saw it produced firmer flesh, and gave more real muscular strength than when the *athletæ* were restricted to the use of pork. This matter of pork was evidently a great mistake, as it produced a different condition of body entirely to that which is sought in training men at the present day, namely, the obtaining of firm, strong, and elastic fibre in every tissue of the body. Galen made a very clear error in asserting that pork contained most nutriment, declaring also that if the *athletæ* left it off for one day they found their vigour impaired the next. The truth is, such a result is utterly unknown in modern training, and, with what we have said elsewhere of the gluttony and real condition of the Roman gladiator, we can

more readily understand and appreciate the grounds on which Galen condemned the so-called gymnastic art.

Again, running horses are said to wear longer than others, and certainly bear fatigue better. These animals, as in the case of man, require strong food in proportion to their strong exercise. Even the jockey, in spite of his poor diet, sweating, and walking during his training, has been known to declare that he had more strength to contend with a fierce horse when *reduced in diet* than when he lived as he pleased. We all know the strength and powers of endurance of some savages, who are in a state of perpetual training. The Australian tribes, which in the interior of that continent have a wide extent of territory apportioned to them by immemorial arrangement, are incessantly moving over that territory according as the seasons and the various productions of its several parts tempt them to linger and enjoy, so long as it lasts, what each region or each season has provided for them. And these examples could be extended almost *ad infinitum*.

But to return to the ancients. The most skilful soldiers were rewarded with a year's increase of land or of corn in rations. Such soldiers as were deficient in these exercises were compelled to accept barley-bread, whilst, before the others received the year's rations in wheat, it must have been shown, in the presence of a tribune or commander of the forces, by appointed trials, that they had mastered all the military exercises. From all these regulations, however, it is evident that *our* present gymnastics have a more limited tendency, their position being that they should be used on the score of health and for producing a good habit of body. Among the ancients, therefore, bodily exercises had three great appointed ends, though they should all relate to one object—public happiness.

Having given a brief outline of what *gymnastics* really were,

and having separated them according to their relative groupings, it remains to consider some other points connected with them. For this, like other arts, has a special object of its own, and should be assigned its proper centre around which its operation is extended. Moreover, though the same subject very often appears to have a correlation with other subjects of the kind, yet they require to be separately assigned and distinguished from each other, at least for practical purposes. Under the same law should we consider *health* in all its various conditions and properties. It becomes us also to regard the human body from one point of view, that in which it is duly subjected to many arts and disciplines. In its natural and mobile state it is to be contemplated *physically*, just as it is subjected to be treated *medically* according to its conditions of disease, and according to the *enecton*—that is, the good habit it is susceptible of, so was it formerly handled by gymnastics or “conservative medicine.” Consequently the human body, when subjected to gymnastics, is found to exhibit *innate* qualities, by which it may be made to display a “good habit” and preserve the same, as even Galen most clearly affirms. Nor on this account is it to be inferred that he contradicts his own declaration when he wishes gymnastics to be separated from medicine, except as in other matters a part is separated from the whole. For medicine regards both disease and health in the body, endeavouring to purge or expel the one, and build up or preserve the other ; so with gymnastics, which, generating a good habit in the healthy body, attempt at the same time to rule over that department of health and the causes of its preservation. On account of this it was held in such estimation by the ancients that Plato and Aristotle (who speak of it more than others) thought it a most desirable art in their republics ; nor was such confidence unmerited ; because as the health of

the mind is so much aided by the health of the body, it should possess both the dignity and honour of a science. The study of it is thus so far profitable as helping and no way impeding the operations of the intellect; on which account Plato is said to have called Protagoras *lame*, because he exercised the mind alone whilst the body was consumed in idleness and ease. To obtain this habit, to preserve health, as well as to induce its restoration, the art of gymnastics must be sedulously applied to. Besides the foregoing testimony of Plato and Aristotle, we have it as a means used by Galen for restoring the extremely weak to a good habit of body, and numerous other persons labouring under disease—the glory of which cures were said to be due to gymnastics alone. But the latter would by no means astonish us did we sufficiently estimate the value of exercise to our bodies. For such purposes the ancients erected the most splendid places, such as the gymnasia and baths of the Greeks and Romans, whilst even in private houses places were fitted up for the daily use of these exercises.

With regard to the time and circumstances under which gymnastics were invented, we gather from the opinion of Galen, who became the chief of physicians after Hippocrates, that it was not till long after Homer's time they were converted into an art, and before the time of Plato their principles only gained ground by degrees. Nevertheless, from the poet's description of the Trojan war, it would appear that its seeds were already widely scattered, and that it began fully to develop itself about that period. Certainly, though it may have existed long before, it was not, prior to that period, either named, cultivated, or formed into a regular art. The writers who raise it from neglect and oblivion, do not hold or believe it to have been a matter of no great consideration, for Galen has recorded his opinion that it cannot be denied that all men

are born with a propensity for music and gymnastics ; nor is this irreconcilable, when the body and mind seem to be made up of both. According to his view, natural gymnastics were common to mankind, and therefore, contrary to Asclepiades, and the over-estimators as well as the condemners of exercises, he was persuaded they existed in every age. We distinctly trace the beginnings of the art to the days of Homer. In the writings of that poet we find mention made of quoit-throwing, games, running, and archery ; and of other sorts of exercises among the Grecian soldiers, which were afterwards transferred to the general art of gymnastics, we also frequently read in the *Odyssey*. But yet we have nothing clearly explained as to what manner, or in what order, they arrived at the art itself, though we may conjecture what many of the exercises were. Plutarch considers that, in the first instance, they were simple contests, in which men engaged with the sole object of gaining a victory, with its accompanying reward, and from this they were afterwards translated into a sort of sacrifice or dedication to the gods, being instituted also to attract the people to these sacred festivals.

Whether in those early times men led more temperate lives than now, and were blessed with perpetual health, studying only the arts of war in conjunction with exercises, so as most skilfully to evade the designs of their enemies, is not very clear ; but certain it is, that instead of becoming slothful, or consuming themselves in inertness, they engaged in these exercises, giving rewards to the victors, and thus alluring men from ease, inflaming them with the hope of reward, and disposing them to contend valiantly with their enemies. A remarkable illustration of this is the description, in the *Iliad* of Homer, of the games and exercises instituted by Achilles for the improvement of his army. From which, and all that

the poet has added thereto, it is clear that in those early ages they took great delight in these exercises, and especially that hope of present reward was judiciously combined with agility and strength, to enable them to conquer in the wars. Subsequently, when the celebration of sacrifices to the gods began to increase in number, these exercises were permanently instituted in their honour,—being considered grateful both to gods and men, so that this alone was sufficient incitement to render them both eager and willing for the contests. Aristotle fully assents to this view, because in these exercises men were even satisfied with the honour attending success. They were thus called by the Greeks, *athla*—trials of skill or games—whilst one engaged in them was called an *athletes*; in Attica, *asketes*; and in the Latin tongue, *athleta*. These contests obtained the title of games, because they were performed not only at the festivals of the deities, but in the amphitheatres, and, before the amphitheatres were built, in the Forum, as well as in private places, wherever the people chose to practise them; these were called by the Greeks *athloi*.

The Olympic games were established in Pisa, or Elis, or Nemea near Cleana; the Isthmian games on the Isthmus of Corinth; the Pythian games at Delphi. Such, among the Romans, were the games of the Capitol, the secular plays, in which poems were sung by boys and girls; and many others of the kind, in all of which, besides the common reward, they obtained the greatest honours, enjoying the praises of the assembly, together with the palm and crown of victory; and, to employ the language of Vitruvius, when they returned victorious they entered their native cities in chariots of triumph, bringing honour upon their countries, and receiving life-pensions by the unanimous voice of the people. But to return to a more general consideration of the subject.

The foregoing systems of exercise applied rather to man living a temperate and healthy life; but as luxury increased, and many thereby were kept a long way from health, so they began to institute exercises to restore health, to cure the weakly, and create a good habit of body, all of which were by degrees practised before the age of Hippocrates, when Herodius united to medicine all that had previously been associated with sacrifices and games, or warlike exercises. But we are of opinion that these contests and exercises, prosecuted for reward and for military discipline, as well as to please gods and men, were even then used for the preserving of health, and with the object of inducing a good habit of body. In the exercises, also, of the first-mentioned kind, and subsequently in the gymnastics of physicians and philosophers, it is very likely they gave out, in a systematised manner, strict cautions how they were to be made to act upon the human body,—some moderately, others stronger; whilst from common use they were transferred to their proper positions and places. Thus were arranged the regular commencement and termination of these exercises, till the entire art began to be called gymnastic—that is, relating to bodily exercises, for by no other means was a good habit of body and health to be effected and preserved. Galen testifies that suggestions respecting them emanated from Hippocrates, Diocles, Praxagoras, and Erisistratus. Therefore, we have something to guide us as to where the gymnastic art had its beginnings, its increase, its position, and time.

As already alluded to, it was first during the Trojan war that the soldiers of Greece landed on the sea-shore from their vessels (whence, we think, originated the saying “in arenam descendere”), and carried out their warlike exercises; whence, also, came the arts of wrestling and gymnastics. After they admi-

nistered to the sacrifices and the pleasures of men, they not only retained their previous names, but the appellation of *athletics* followed, and were afterwards styled, according to Galen, "corrupt or vicious gymnasties." At length there sprung up gymnasia, and certain places for the educating of youth, as well as for preserving the health of others, and creating a good habit of body; and their system, under its conclusive form, truly deserved the name of gymnasties, such as it had been before the time when Plautus mentions it in his *Mostellaria*; and we cannot refrain from quoting the lines addressed by Atticus to the young Philolaehes:—

"Cor dolet, cum scio nunc et sum, atque ut fui;
 Quo neque industrior de juventute erat
 Arte gymnasticâ, disco, hastis, pilâ,
 Cursu, armis, equo."

Still it may be correctly said (as Marcus Varro has insisted), that this art only flourished among the ancient Greeks; for when the rural districts had been made by the Romans well tilled and fertile, they found themselves stronger in health, without need of the former. Yet, after the idleness and ease of the city increased, they were unwilling to labour in the country, and were led then frequently to extol the pleasant gymnasia of the Greeks, of which, as Varro laments, there was scarcely one in his time, whilst in Rome they flourished under the Emperors, and were in size and splendour unsurpassed. But even under the Roman Emperors they one by one declined, were either destroyed or fell into decay, and the art itself *pari passu* was gradually overthrown. Therefore, from the time of Varro till the gradual decline of Imperial Rome, its practice became less and less frequent. Still all the physicians of that age in Rome, who were wont to recommend the art of exercising, either for the cure of disease or the preservation of

health, applied it from such knowledge as still survived. We observe it recorded, and may, in fact, gather it from the writings of Plutarch, that every person in his time was occupied with exercises, though Pliny declares that some of these exercises were not for honest purposes, but those of excitement. The latter, however, viewed apart from its moral sense, is an example of the great power of these appliances in rousing the dormant functions of the body. Consequently it was a mere hallucination of Budæus that the Romans used the *gymnasia* and *palæstræ* rarely.

In now considering the general characteristics of the ancient gymnasium, it is clear that exercises were wont to be done in certain places, as before stated, it being only reasonable that such places should be distinguished from others. Galen, in his writings on the preservation of health, verifies this by mentioning that the public gymnasium was built in a place separated from the rest of the city, in which they anointed, used friction, wrestled, threw the quoit, or practised such like games; which places were also so called because they exercised there, and oftentimes naked. For this most ancient term relates to "nakedness;" and Eusebius remarks, on the authority of another person, that among the Greeks any other condition was forbidden but the one that they should exercise in the gymnasium with naked bodies. But that all and each denuded himself for the sake of healthy exercise is not known for certain, whilst we suspect that the wrestlers, boxers, and others were more powerful naked when training for *athletæ*. For decency's sake they wore drawers in public, as they did in the private contests in Homer's age, by whom mention is made of their being demanded by every principle of decorum. One Orsippus, as related by Pausanias, lost the victory through his trousers or drawers falling down. But although, as the latter

states, it was continued to his own time, it was subsequently altered to the foregoing condition, that little or no impediment might arise to the free movement of the body.

After this time every place wherein they exercised themselves was called a gymnasium; though this title, at a period still more remote, was transferred to other places, as seen in Josephus, who, in his account of the Jewish wars, shows that (where he is speaking of Herod) the baths were sometimes called gymnasia; that at Tripolis, Damascus, and Ptolemais, there were public baths they called gymnasia, where they also studied on the benches of the outer porch. We have found these places also called by Vitruvius, Celsus, Pliny, and other authors in the Latin tongue, *palæstræ*. Yet they appeared to be so rare in Italy that Vitruvius, in his work on Architecture, has declared that these edifices were not built after the manner of the Italians. The first who built gymnasia were believed to have been Greeks, if we credit what Lucian says of Solon, and also Cicero's declaration in one of his orations, that gymnasia were first copied from them, both for enjoyment and exercise. According to the opinion of Athenæus, the first who erected them among the Greeks were the Lacedæmonians, and this is borne out by the writings of Plato respecting the theatre, as well as by the indelicate allusions of Martial in his fourth book. Plato also relates that between the time they flourished and his own age nine thousand years may have intervened, and even *then*, he tells us, gymnasia existed. It is, therefore, difficult to discover who makes the invention belong to the Lacedæmonians, unless we believe the whole narrative of the Fortunate Isles to be fabulous, which it probably was.

After the Lacedæmonians the Athenians also erected their gymnasia, of which Pausanias testifies that there existed three in the city; one called *Akademia* or academy, in which Plato

professed his philosophy ; another the *Lyceum*, where Aristotle taught. According to Lucian, one was called after the temple of Apollo, the other was called *Kynosarges*, where all the ill-bred, illegitimate, and ignoble exercised (for among the Greeks the illegitimate were held in much odium and contempt); whilst those who were legitimate and noble, according to their custom, refused to exercise in the same place with these people. Besides these three, mention is made of another called Canopus, but of which little is known. It has been already said that in the city of Athens were three gymnasia, yet they were actually without the city, though built not far from it, so as to be near it, at least so far as we are able to decide. In these it was the custom of the Greeks to bury their dead, or a distinguished portion of them, for Cicero, in his familiar letters, mentions certain persons lying in the Academy at Athens, the noblest in the whole world. Ligorius writes that he found the whole most skilfully represented in the vestiges of the villa of the Emperor Hadrian. The Athenæum, Hermeum, and Panathenaicum, it is thought, were chiefly gymnasia where they exercised their bodies; but the same title is given to the places where they engaged in the study of other arts and discipline, or celebrated their festivals, as the Panathenaicum for the festivals of the Panathenæa. Corinth also had its gymnasium called *Craneum*. Laertius also states that there was scarcely any walled town of the Greeks that had not its gymnasium, giving this on the authority of Anacharsis. The last of all the forms of gymnasia of Rome, called the *Palæstra*, was built in that city in emulation of the Greeks. At this period the *Thermæ*, or hot baths, surpassed all other works of the kind in grandeur and beauty; whilst their ruins to this day continue to be the admiration of every beholder. The poet Martial thus wrote of the baths of Nero:—

“ Quid Nerone pejus ?

Quid Thermis melius Neronianis ? ”

According to Plautus, even before the time of Nero, there were gymnasia in Rome, which were built in low neighbourhoods. The gymnasia and thermæ were frequently confounded together, from the simple use of hot water, as we gather from the language of Latin authors ; but it must be remembered that “therma” applies to a part of the gymnasium in which they washed (it was especially so in the Grecian buildings of the kind), and where the mouth of the furnace, the heated room, and the hot water, were all situated. The gymnasium, thermæ, stadium, or ground for a “course,” were certainly near each other. We need scarcely, however, enter into any of the controversies among learned men of the past on this question, but will endeavour to give the sense of what Vitruvius has written on the construction of the palæstra as well as the covered porch.

The whole of these buildings were considered by the latter writer to have originated with the Greeks. In the palæstræ were constructed the *peristylum*, a place enclosed by pillars, and possessing a portico ; also the *squares* or *oblong* places where there was a circuit of about two furlongs, which the Greeks called *diaulon*, and from which three single porches were arranged, and the fourth, a double porch, turned towards the south, by means of which, when there were tempests of wind and rain, the interior was protected from the wet. They also built in the three piazzas, or porticoes, spacious *exedrae*, or places jutting out with seats, in which the philosophers, rhetoricians, and others enjoyed their studies, being thus able to argue or dispute sitting. In the same manner the following divisions existed in the double porch :—The *ephebeum*, a place where youths exercised, being in the centre (as this exedra

was amply provided with seats, of which the third part was rather longer than wide) ; under the right the *coriceum* ; then next the *conisterium*, for sprinkling wrestlers with dust after they were anointed with oil ; and in the porch leading from the *conisterium* the cold bath, which the Greeks called *loutron*. To the left of the *ephebiūm* was the *elaotheresim* ; whilst next the latter was the *frigidarium*, the way from which into the *propnigēum* was by a turn of the porch. Near to the cold bath was placed the *laconicum* and warm-bath. The peristylia were equally distributed throughout the palæstræ.

Thus externally there were three porticoes or piazzas, one going out by the peristylum and two right and left of the stadium. One of these, looking towards the north, was double, and of most ample width ; in other parts of the building they were single, as in the parts which were around the walls, and where there were columns, the margins having a footway of not less than ten feet. The latter, also, were excavated to a depth of twelve feet, having steps, two by two, a foot and a half long, from the margin to the ground. Those who walked here were thus in no way impeded by the exercises. This porch was called by the Greeks *xustos*, because the *athletæ* exercised in the covered stadia during the winter season. It was chiefly in the *xystum* or *xustos*, the covered piazzas, and double porch of the *hypæthra*, which was open above, that they walked about. In these, during the winter months, when the sky was serene, the *athletæ* exercised themselves. Between these porches were vines or plane-trees planted, around which were posts of plaster. And after the *xystum*, the *stadium* was so constructed that a multitude of persons could with ease witness the athletic sports, which we see were necessarily placed within walls, as already described.

Galen tells us there was a great variety of men haunting the

gymnasia, who very often got up disputes among themselves, and Seneca complains of continually hearing their noise and clamour. Varro mentions its having become the custom in the baths during his time for persons to cry out and make a great noise, just as the idle do in our day. But the men, whose presence dignified the gymnasia, were of a very different stamp to any of these. The chief were the philosophers, the rhetoricians, and others, who employed themselves in study; there they read, conversed, and often disputed, as mentioned in the Seventh Satire of Juvenal. To the latter Galen adds his own testimony, by mentioning the name of Theagenes, a philosopher of the Cynical school, who publicly disputed daily in the gymnasium of Trajan. For there were three places in Rome in which they performed their literary exercises, distinguished from others by Galen's account, viz., the Temple of Peace before it was burnt, the public gymnasia, and the akousteria, a school or lecture-room. In the latter of which, if we mistake not, a medical school was included. This edifice was built upon the Mons Esquilinus, and adorned with many statues and marbles, which were observed by Ligorius in many parts of the ruins; whilst the very best laws emanated from this school. The rules and precepts for the study of medicine were doubtless wont to be drawn from thence, as they now are from our halls and colleges. Indeed, a school of this kind had its appropriate registry office, as shown by a marble found in Rome by one Sebastianus with the following inscription:—

M. LIVIO. CELSO. TABULARIO.
 SCHOLÆ. MEDICORUM.
 M. LIVIUS. EUTYCHUS.
 ACHIATROS. OLL. D. II.
 IN. FR. PED. IIII.

There was also another description of youths who came to

the gymnasia that they might learn the rules and eustoms of mental exercises, and where they sought bodily exercises also as taught by the gymnasts. That youths were accustomed to study in the palaestra may be gathered from the second scene of the third Act of Terence's *Eunuch*. The *third* kind who exercised themselves there were the *athletæ*, the populace being much interested in witnessing their process of training for the public games or sacred festivals. Suetonius declares that Nero was wont to enter the gymnasium that he might observe the athletic sports. A *fourth* kind of persons were all those, whether noble or ignoble, who either for discipline or bodily strength in following the military profession, or to preserve and maintain a good habit of body, sedulously applied themselves for the sake of testing the various sorts of exercises. And whilst many reckoned it one of the chief places of resort, one writer, Pamelius, openly declares that their youth displayed in the wars the strength they had gained in the gymnasium. In subsequent times, we gather from Galen that he himself had reduced many dislocations of the shoulder in the palaestra.

The *fifth* kind were those who were *rubbed*; for frictions were performed by many before taking the other exercises; and many were rubbed without taking the exercises at all, as we learn from Galen that *friction* was distinguished from other means by being preparatory to exercises. The *sixth* kind were those who bathed, and were sometimes of course noble and sometimes ignoble. It is important here to note that the rich and chief persons had their proper baths and rooms apart from the common people, where they bathed at different times alone. Pliny tells us that many of these baths were of wood or silver, and that the wealthy did not place their feet where the common people placed theirs; though he states that in the reign of Hadrian some washed where the common people washed, as

Suetonius also mentions to have been the case in the baths of Titus.

Lastly, there were a considerable number of spectators,—among whom we do not include the assistants of the gymnasia and baths, of whom we shall presently speak,—who met together for no other purpose than lounging; or, being otherwise unoccupied, came to see the exercises. With regard to the latter, it may be considered certain that the gymnasia were more frequented during days of festivity, when the artificers and other servants who were permitted relaxation were wont to divert themselves there. Women also exercised in the baths of Rome, but in what manner we can say little beyond what must have been unworthy the dignity of that city, provided the improprieties admitted by Juvenal and Martial really existed. Still there were separate places where women could exercise alone, as there were also private baths in which the better class of women bathed, and a common bath for those of the lower class. Others bathed in a variety of ways; as Poppæa, the wife of Nero, who is spoken of by Pliny as using the milk of 500 she-asses in which to bathe, in order to increase the whiteness and beauty of her skin. Galen mentions that other females, for the purpose of whitening their bodies, used the powder of beans, others nitre or saltpetre, in the baths. The Spartan men and women were accustomed to exercise together in the palaestra. Nor should we be so much surprised at this custom when Plato gravely argues, in his Republic, that it would conduce greatly to public happiness and morality if, when young, the sexes should exercise together in the gymnasium. Here purity of intention was in the mind of Plato, though such suggestions, doubtless, only aided in giving a utopian character to his great work.

CHAPTER III.

Account of the ancient Gymnasium continued—Inunction, Friction, Pressure, and Percussion—The public Baths.

CONTINUING our description of the different parts of the gymnasium we may say that Vitruvius, who flourished in the age of Augustus Cæsar, has alone clearly described the Greeian palæstræ, as we gather from his own words at a time when the Roman Emperors had not yet commenced building their gymnasia. Of which buildings, however, it is probable that many were like the gymnasia of the Greeks, and it is equally probable that the Romans (as may be the manner of posterity in treating old customs) may have learnt many things from their use, of which the Greeks were either ignorant or set little store by. In this matter the testimony of Vitruvius is not considered to be of the highest, for much may be better gleaned from other writers who have touched on the subject, whilst during his time, and subsequently, few great public buildings beside that for the *balistæ* were erected in Rome. Few indeed are mentioned by any subsequent author.

Therefore it was that in the chief parts of the gymnasia there were covered porches or open pavements in which the philosophers, rhetoricians, and mathematicians—in fine where all the lovers of discipline, disputation, reading, and teaching—exercised themselves. There were some persons also whose conduct gave rise to the saying, “more willing to attend to the quoit than

the philosopher," yet who seated themselves among the philosophers; but the ringing of the quoits soon drove them from the schools of wisdom to the place nearest the games or contests. In this covered way of the philosophers these youths and boys who were actively engaged in the labours of discipline and study were rationally employed; because it was so arranged that these scholars after exercising their minds should exercise their bodies also, for the sake of the health and strength which they require at this period of life; and then afterwards to bathe themselves and return to their homes. How different is the condition of modern education, in which we too often see the child of great promise, who, brought early to the "cramming" system too prevalent with us, and being for several years submitted to its exhaustive processes, attains at manhood both to intellectual dulness and unsymmetrical physical development. It has been our lot to witness several examples of this kind. One, a remarkably quick intelligent child, short, compact, and active, changed to a tall knock-kneed youth, so dull that his father was in despair at finding him unfit even for his own *business*! In the early part of this century, the eldest son of Lord Sidmouth, a youth of great promise, and a favourite of William Pitt, was so ambitious of distinction when at the University of Oxford that he overstrained his powers of mind. In the following summer he was dangerously ill, and when the danger had passed it was found he had sunk into a state of stupor or rather imbecility, never stirring, never speaking, and giving no sign either of pain or pleasure. He continued in this mournful state *eighteen* years, dying in 1823.

Among the Roman youths we may place the medical scholars, if any existed as such. Alexander Severus, after reading, engaged in the customs of the palaestra, such as ball-playing, running, and gentle games; bathing afterwards.

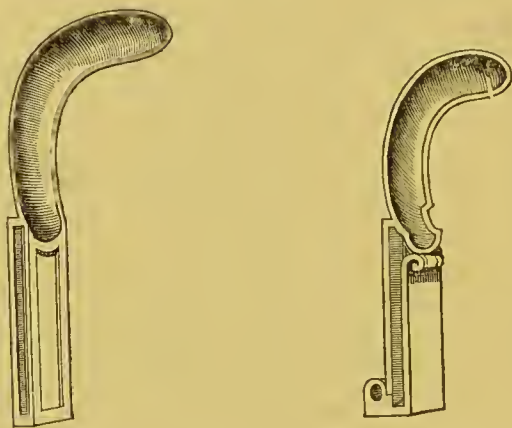
The next portion of the building to be noticed is the *ephebeium*, which appears to have resembled the other parts, inasmuch as the youths here had contests, by way of practice, among themselves. It seems also to have been the opinion of Philander that the fullgrown boys exercised here, though Choulus, in his book on the exercises of the ancients, lays down the dictum that the youths *sat*, for the sake of study, in the *ephebeium*. But we know not whether this was practised among the Romans, who forbade youths mixing with men before they were sixteen years of age. In Galen's time, however, boys were wont to exercise in the *palaestra*—as the boy Commodus, the son of the Emperor Antoninus, restored himself from sickness by the same means. Mention is also made of their exercising boys in the *palaestra* by climbing ropes, to augment their strength. A good illustration of the fact is also furnished in the *Bacchides* of Plautus, where a pedagogue reproves the fathers of his time for indulging their sons, and reverts to the practices of former days when they were subjected to the valuable discipline of the *palaestra*. It was the custom for youths to go to the latter in the morning, that intercourse with men might thus be avoided, and that, owing to the latter not coming early, they could not be molested in any way at their studies. This seems also to have been the case in the public gymnasia of Rome prior to the sovereignties of Nero and others.

The third part was the *coriceum*, which was used by naked men who were there specially attended to in the way of exercise, bathing, or otherwise; by others it was called after the Greek *apodyterion*, and from Galen *gymnasterion*. It belonged not only to the public but the private baths also, as Plinius Cæcilius in the description of his villa at Tusculum enumerates, amongst other details, the *apodyterion*. Some per-

sons, however, have confounded the *coriceum* with the *corycum*, a species of ball, as if such games were performed there, or with the *couriceum*, a barber's shop, or the *korai*, where, among the Greeks, the youths and maidens exercised. The *fourth* part was the *elæothesium* or *aleipterion*, called the anointing place; and here they anointed before entering on exercises, or bathing, as well as for comfort. Yet this process demanded so much care and attention that it became a special business or office in the gymnasium, and is mentioned even in the works of Athenæus, as the rationale of anointing. The principles of anointing were four: *first*, regarding when and whom should be anointed; *second*, what the materials of the ointments should be; *third*, for what purpose they were anointed; and *fourth*, in what manner and by whom the anointing should be administered.

Those who came to bathe or exercise in the gymnasium were for the most part stripped in the apodyterium. Boxers, runners, and many others, did not need much anointing. The *aleipterium* supplied its ointments, and anointing was also performed in a place where there was powder or sand, some being sprinkled all over with powder; and thus were they variously fitted for the different exercises. After exercising themselves they returned to the anointing place, where they were scraped by the slaves with iron *strigils*, and reanointed, by means of which they were thoroughly cleansed of oil, powder, and sweat, at the same time they were served with a medicated mixture, called, from Ionia, *konisalos* or exciting powder, but by others *potos* or adhering powder, as can be readily confirmed by the writings of Dioscorides, Pliny, and others. Yet Avicenna, in his second book, makes mention also of the sweat and moisture of the *athletæ*, which had nothing to do with the oil or the sand, and for which, in the time of Galen, *strigils* were used in

the baths. These strigils were frequently of sponge or linen; but each person usually carried them with him, and especially those who wished to avoid contact with the instruments used in common. Sometimes these strigils were of iron, gold, silver, horn, ivory, or brass, with which they removed the off-scourings of dirt from their bodies, usually accumulated in the exercises. The strigils of brass were like those which were formerly found in the ruins of the baths of Trajan.



Again, even while some were most careful in keeping their persons clean, they anointed for the sake of health and comfort, and sometimes used inunction on entering the bath, again anointing themselves on leaving it,—sometimes with simple oil, sometimes with a mixture of various scents, sometimes with a perfume to restrain perspiration. Pliny adverts to the latter, because there were different periods of anointing, to which allusion is even made in the *Odyssey* regarding the washing and subsequent anointing with fat oil. They were also anointed while lying at their tables, as we gather from the clearest testimony. In this part of the gymnasium there were, doubtless, persons who for their livelihood assisted the bathers

in dressing, and these were called *olearii*, oilmen, such appearing to have been the custom in the baths of Asia. In Aristotle's time they anointed with simple oil and oil mixed with water; for he especially directs that they should mix water with the oil when used for exercising, the better to bear fatigue than with simple oil, because it thus penetrated more readily the body, and relieved its members from their parched condition. Hippocrates, however, forbade this kind of inunction, on the ground that their bodies were more than sufficiently heated already with the exercises. Pliny most distinctly says that among the errors which the Greeks imported into the gymnasium was the oil, which Anacharsis considered to be the medicine of madness, because the *athletæ* appeared to be maddened by it. Among some barbarous nations with whom oil was wanting, there was a kind of mixture used, made up of oil, powder, and wax mixed; and this may be what Pliny calls *ceroma*, with which the Roman youth, in over-exercising their bodies, also overbalanced their strength of mind. The *ceroma* was so called after the place where they anointed, which by others was styled the *alipterium*—anointing place. Pliny mentions the custom of sweetening with oil against the vile odours of the gymnasium. But all these anointings, it should be understood, were exhibited *before* the exercises; whilst, after the exercises, and after the excessive bathing, they used sweet ointments, which were calculated to produce lasciviousness and sloth. And we think this is shown by Plutarch where he states that Solon prohibited dry unctions or frictions, unless they were performed after the bath, or even the fumigations, as it is understood. This custom of using scented oils flourished in many parts of the East; for Athenæus relates the circumstance of its being the custom in the games under Antiochus Epiphanes to exhibit during the day scented oils

for contending with, of saffron, sweet marjoram, fenugreek, flower-de-luce, and others, with which they anointed their bodies. Authors, however, differ very much on these points. Hippocrates commands that oil should be mixed with powder of earth alone, merely to temper the heat and humidity of the body. Alexander gives it as the custom of the *athletæ* to be anointed all over with the same oil, which induced a softness of their members, preserving them from any danger of rupture during their exertions. The custom of the wrestlers was to sprinkle themselves with powder or earth that they might render their bodies stronger. This gave rise to the notion of strength derived from falling on the earth during the contest between Hercules and Antæus—

“ *Auxilium membris calidas infundit arenas.* ”

Plutarch seems to have held the opinion that the *athletæ* used powder in the ointment both to cool their heated bodies and restrain perspiration, so that they might not feel so weary from the latter. The very best use of powder was that they should free their hands from oil, and by this means render themselves the better fitted for exercises, as well as to restrain perspiration when their bodies were exposed to the wind. For this reason, the powder was called *aphe*, which relates to the touch, as *flavescit aphe*, to make yellow with dust. Hence, if any unsprinkled person conquered in the contests another who was anointed in the above way, he was worthy of so much more glory; as, according to Pliny and Pausanias, both Dioxippus and Dioreus merited the title of *akonitai*—unsprinkled with powder. Many other persons believe that people anointed themselves at their exercises to keep away cold or chilliness, and to ease themselves from lassitude. Galen perceived that oil removed previous lassitude, and mitigated

that which was induced; it prepared them also for active motion. To the oil also was added wax, so that it adhered much longer. No doubt these inunctions, when administered after the bath, did good service, preventing either the humidity acquired from the baths disappearing, or the natural heat of their bodies being abstracted together with that artificially acquired from the baths.

Still we have found nothing definite as to the mode of *anointing*, though it is very probable that no one when he first rubbed himself did it with his own hands: they probably rubbed one another. There were servants attached to the gymnasia for anointing, called *anointers*, who rubbed the exercisers beforehand, for the better penetration of the ointment, and all over the body lightly, in a chafing or pressing manner; and, according to the requirements of the time and season, they applied tepid, hot, or cold liniments, all this being done chiefly in the *alipterium*. Some were rubbed over with salt or saltpetre, for the better cleansing or drying of their bodies.

The *fifth* part of the gymnasium was that which was fitly called the *conisterium* or *konistra*, in which place the powder was preserved, that the visitor might be more readily sprinkled and anointed. We learn that the powders were brought from various regions, two being held in the highest estimation, namely, those from Puteoli and the Nile. The latter earth or sand was first brought for sale by the generals and common soldiers of the army of Alexander the Great.

But we must here digress from the ancient records, to give something of modern experience. And we may say, that any one who has witnessed the value of friction in the dropsical condition which sometimes follows *scarlet fever*, especially where warm baths have not been used so soon as the skin begins to exfoliate, will not deem it unnecessary.

Modern testimony as to the use of *inunction* in fevers, was given some years since by a surgeon of the name of Taylor, then practising at the east end of London. He published an account of it under the title of "A new and successful Treatment of Febrile and other Diseases, through the medium of the Cutaneous Surface."

This gentleman arrived at the ancient conclusion, although under conditions of even a more important character than that of administering to the health of the external envelope of the body. He pursued his plan in one or two of the most dangerous forms of disease. He says, "It had often struck me that, in fever, a distinguishing feature was a dryness and contraction of the cuticle, almost invariably preceded by chilliness, which changes I suppose to be caused by a cessation of the secretion from the sebaceous or other cutaneous glands. When this condition was amended, the complaint seemed to assume simply the aspect of a common 'cold,' and then soon disappeared. But, if the functions of the skin continued suspended, the sebaceous follicles having ceased to act, the condition of the patient was speedily marked by reaction, with manifestations in the form of headache, quick pulse, hot skin, and all the well-known symptoms of fever. Thus, the insensible perspiration, instead of being thrown off from the surface, becomes what is called 'determined to the lungs;' the breath is loaded with aqueous vapour, the tongue white and coated, and a call is next made by nature on the kidneys, which then set up an increased action." Now, there is a good deal of very obvious truth in the above description, and it could possibly be hardly better described. But the most astonishing part of the matter is, that all these symptoms have disappeared in a few hours by placing the patient in bed, and having the surface of the body well rubbed with what he termed the "hard oint-

ment." This ointment can be made by any one, at any time, and merely consists of lard combined with suet in equal parts, melted carefully over a slow fire till it acquire the consistence of common tallow. It must be rubbed in to *saturation* to produce its full effect; its action, beyond that of ordinary or dry friction, is shown very forcibly in one case of an old lady, who by it obtained warm feet, whilst dry friction failed to procure such results. There would appear, therefore, to be a virtue in all time to be found in this saturation of the external skin, combined of course with friction. Smoothness and softness are readily procured in place of dryness and hardness of skin; but the saturation and rubbing must be undertaken as often as required, till the beneficial change in the condition of the skin shall be thoroughly arrived at. It may appear strange to advocate such a remedy in the last stage of febrile or other acute diseases, and patients might object to it, as they do, in the belief that some unreal mockery is being practised upon them: yet the fact remains. In a few hours, comparatively, a wondrous change is often wrought in the body of the patient. The ointment does not impede, but, on the contrary, restores the functions of the skin. It also assists the action of medicines, owing to the cool external surface of the body, and has been found useful in the severest cases of dropsy, typhus fever, scarlatina, measles, delirium tremens, and hydrocephalus. Mr. Taylor remarked upon the fact that inflammation of the lungs, one of the most frequent complications of typhus, rarely occurred at the Clerkenwell Infirmary when this method was used, and the mortality was reduced very considerably in all cases.

This is certainly a proof of the value of the *inunction* by the hard oil and wax ointment of the ancients; so as not to restrain sweat and throw the whole burthen upon the lungs, which were well tried in their gymnastic contests, but to give full play to

the function of the skin as a compensatory balance. As a means of restoring the function of the skin, therefore, Mr. Taylor and others are backed by a testimony of the most ancient kind. Sleep is readily procured by this friction in certain cases, and *mesenteric* disease is frequently cured by it. It is consequently nothing more than an old and valuable means revived from age to age, though it may appear to some a disagreeable method of procedure. But let any one experience the immediate sense of delight and positive enjoyment felt by the patient, the rapid recovery, the refreshing sleep, and the disarming of half the terrors of the malady, and he will view such treatment as both practical and desirable, in spite of the appearances opposed to its adoption. This is an example of *inunction* with friction to the *entire* surface of the body.

Local *friction* and general *friction* are equally valuable; in truth, friction may be taken to be itself an exercise, and oftentimes a substitute for exercise. With the ancients it was more a matter of luxury than necessity; with ourselves it has become a necessity, chiefly in consequence of our neglect of bodily exercise. The *inunction* and anointing with them were but one and the same process. The antiquity of anointing is very great, and in the sacred volume we find it often alluded to. In truth, the special rules for anointing are peculiar to the ancients. Scented powders were so largely in use that one of the Roman Emperors is said to have refused a post of importance to some patrician dandy, who entered his august presence smelling too highly of sweet scents. The anointing process appears to be used more generally by the inhabitants of hot countries than those of cold—the former being more disposed to apply their grease externally, and the latter, on the contrary, internally. The Grecian and Roman use of the oil *inunction* at their contests was to “retain the vital spirits more

effectually within their bodies,” and this is why Aristotle ordered oil to be used mixed with water, the more effectually to be absorbed, and enable them to endure fatigue. But if they were braeed at all by these measures it must have been through the perspiration being thus retained, as seems to be evident from a remark of Hippocrates, in the second part of his treatise on Diet, that the least quantity of these ointments should be allowed, as they serve to produce an excess of heat in the body. Believing the latter to have been the case, we can understand the statement of Pliny that the *athletæ* were maddened by them.

In stiffness and immobility of joints, where true ankylosis or absolute union of bones has not taken place, experience has shown that there never was, and never will be, a “stiff joint,” or inaccessible portion of the frame, rendered immoveable by interstitial depositions, that cannot be gradually restored. The process is slow, and demands much patience, but it is sure, and without it people may remain crippled for life. Friction and passive motion are combined in this process. The conditions on which the cure of stiff joints and the like depend are threefold, viz., innervation and vascular activity resulting from friction, passive extension of the limb or tissue, and energetic attempts at motion on the part of the sufferer. The system of friction adopted both before and since Mr. Grosvenor’s time is very simple, and easily understood. The primary object being to produce excitation of the part, brisk rubbing, with a certain degree of inunction, both to favour the play of the hands and prevent abrasion of the skin, is necessary. In thus rubbing it is more efficacious, and less tiring to the operator, to make long and brisk strokes—one hand ascending whilst the other descends. The material, as a simple protection merely, may consist of fine flour, and vegetable or animal

oils in not too great quantity; these frictions to commence, as to time, according to the ability of the patient to bear them, and may be usefully extended from half-an-hour to three hours daily. Most of our readers may have smiled over the popular notion of the efficacy of "joint-oil," where it is needless to attribute the good result to the simple process of *friction*. It is yet, to us, an instructive and harmless belief of the uneducated classes. In all cases where inflammation is actually existing, or but slowly subsiding, it must not be used, or if it be, with extreme gentleness and caution. But, at the same time, it should be held as a maxim, that the earlier it is resorted to on the subsidence of inflammatory action, in such cases as those of inflammatory gout and rheumatism, the more speedy, certain, and lasting will be its results. The rule of friction or rubbing is to begin very gently; and in all cases where it is intended to bring parts into a state of normal activity, friction should precede motion, or, what is more readily comprehended, the first attempts at motion. The latter, of course, will be of the passive kind; and where there are adhesions the skill of the surgeon should be exerted to break them down, which may be done under chloroform. It may be pursued after orthopædic operations, or primary ruptures and injuries to tendons. Even in acute *gout*, or rheumatism, relief is experienced by the patient from friction, which must at first be commenced at a distance from the affected or inflamed part, gradually approaching it as the pain is found to subside. Many a sufferer may be greatly relieved in this way, and if managed as above, there is no danger of giving pain by the operation. It must, of course, be used with other medicinal measures. In this instance the friction must not be employed in the usual way, but the hand must be passed lightly upwards—that is, *from* the seat of inflammation, gradually

approaching the part inflamed; when such appears to be the effect produced upon the vessels leading from the seat of pain, that even the part itself, the great toe for example, can be safely submitted to the operation. But if not performed slowly, carefully, and gently, it is an operation that may meet with rather an unfavourable response on the part of the gouty patient.

It is surprising we should so much neglect so important an agent as *friction*; for it is apparent that there is a power possessed both by the nerves and arteries of a part to produce, on the application of friction, a great and instantaneous change in its circulation, independent of any impulse derived from the heart. More than this, the heart, the great centre of circulation, has been as it were reached by these means; for a man has been recovered after hanging half-an-hour, his neck of course not having been dislocated. Thus it is that the relief of local pain by friction, near or remote from its seat, is very striking, and the ability to do this resides with every one of us. In a scientific point of view it may be held, that by exciting local nerve stimulus remote from the seat of pain, we calm, by counter-irritation possibly, the existing hyperæsthesia. And this explains how it is that mere friction on the skin, distributed as it appears to be to the peripheral or surface nerves, affects the deeper-seated portions of the frame. It is highly serviceable in mesenteric disease at its commencement, and in cases of *chorea* also, when combined with passive and active movements.

It was an excellent plan of the ancients, and one that is worthy of imitation at the present day, to use friction after their vapour baths. It should at the same time be observed, that the ancients were justly more partial to vapour baths than hot-water baths, for the latter medium in a measure counteracts the expansion of tissues. By the combined use of vapour and

friction in rheumatic-gouty cases the cure is vastly facilitated. The reason, as it appears to us, why the vapour bath as an excitant in rheumatism, lumbago, and sciatica, has not maintained its ground as it ought, or produced fruits commensurate with its acknowledged powers, is to be traced to a neglect of the above precautions. It has been left to perform alone the simple office of an excitant, the effect of which is of short duration, although its repetition may be constant, and the patient in most instances fairly exhausted by the remedy. On the other hand, when followed up by assiduous friction the original impulse is multiplied; *motion* is imparted, absorption put into active operation, and the effect becomes continuous. This also explains the fact of friction alone being sometimes capable of producing like results; yet it is equally evident there is a great gain in point of time, so as to make the one almost inseparable from the other. In the case of *sciatica*, which is oftentimes the most troublesome and difficult of disorders, friction will at certain times seem to aggravate the pain and irritability endured by the patient. In the earliest stage of the attack—at its commencement, in fact—strong exercise to the muscles of the limb and the body generally has been known to remove it entirely; but so soon as it gets possession and permanency, as it were, such treatment can hardly be borne; yet perfect *rest* is sure to render this disorder more obstinate, and the lameness more complete. Exercise obviates the latter, preventing shrivelling or atrophy of the muscular tissue of the limb. The kind of friction that irritates in this disorder is of a superficial character, applied as if to the mere surface of the skin, the irritation to the nerves of which is reflected to the diseased part, increasing the pain; but what may be called deep-seated friction, which consists in a strong degree of pressure upward along the vessels and nerve, with

shampooing and rolling of the muscles between the hands, will be followed by a soothing effect. Consequently it is that the earlier such a disease as *sciatica* is treated the better chance there will be of satisfying the patient that such means will afford him any relief, whilst, whatever amount of misery he may be called upon to endure from neglect of this, his cure will in reality be more speedy, and, what is of the highest importance, the loss of power and museular atrophy of the limb, as alluded to before, will be obviated.

When it appears that friction is so excellent an agent in the dispersion of pains and local spasms, it is obvious that there is not only a wide field for its use, but a very simple guide as to when and how it should be employed. *Pain* experienced in the region of the liver, stomach, or bowels, from concussion, slight internal congestion, and stricture, either from partial devitalisation of a tissue or tonic spasm of fibre, may be dispersed by friction, applied at first *very gently and superficially*. In some of these cases, especially those of the stomach or bowels, peristaltic movements and gurgling may be felt and heard, and at the same time a cessation of pain. How readily it will aid in producing sickness where the stomach is oppressed by undigested food is well-known to us all, and was not less so to the ancient Romans, as we learn in this book, some of whom were wont to use it not only for the purpose of discharging redundancy, but preparing the way for more. In all cases of pain and spasm, whether superficial or deep-seated, friction should be commenced in a brisk, light, and superficial manner. In cases of severe headache, relief may sometimes be afforded by friction, pressure, and vibration in the region of the frontal, temporal, and occipital nerves. These cases of removal of pain are examples of the use of *dry* friction, and explain the manner in which it differs from other kinds of friction. Fric-

tion again has been employed to produce local irritation by caustics, to bring about a translation of the disease from the interior to the exterior, or of another kind where it is desired that the agents so employed should be absorbed into the circulation. With the latter it is probable that the chief agent for good in the matter is the *friction*, the ointment or other application being really subordinate in effect. This is certainly the case with dry or superficial friction. The latter is the degree of friction that is so valuable as a counter-irritant or divertive, through nervous agency, to relieve pain by exciting reflex action in the part. It is not a system of friction that is to be used either for promoting active absorption, or rousing and accelerating the circulation, or at the same time developing animal heat. Deep-seated and powerful friction, often with inunction, is the most useful in the latter cases.

Friction is, therefore, deserving of all honour, because it is in itself a perfect substitute for exercise, where none can be taken by the patient. It is this circumstance that gave rise to that spinal rubbing so much in vogue lately at Edinburgh, and the clever practices of the late Mr. Harrup of Brighton. They applied friction the whole length of the spinal column, as well as locally. We are not sure also that, through over-excitation, permanent mischief may not be done by injudicious persons in such cases. Where little discrimination is used, as in cases of loss of power from true cerebral or spinal disease, the existence of the individual so afflicted may be, at best, shortened. Yet, as a general excitant to the torpid frame, both to enliven the action of the voluntary muscles, and promote secretion through the intimate connection between the spinal and sympathetic systems of nerves, this sort of friction is of paramount importance; and, wherever or by whom it may be practised, will ever be earnestly sought after. Thus its usual

effect may be witnessed in a preternatural excitement of the circulation as well as of local secretion ; but, like all other remedies, should be abandoned as soon as the desired end is accomplished. Were this powerful agent better controlled than it is by the legitimate practitioner, and not resigned to the unguided management and rule of uneducated people, it would in all time maintain its ground as one of the most useful adjuncts of the healing art, and no longer rise and fall in professional and public estimation. Producing, as it does, its full effects through the agency of the nervous system, we find that it reaches each part of the body in the direct neighbourhood of its application. There is a doubt whether as much can be said of local bleeding, or operations on the vascular system alone, because the effect of the bleeding is general and not local. Allowing also, that in conditions of obvious fatty degeneration, and in that of heart disease where there may be no suspicion of calcareous deposits, and where muscular excitement should be avoided, especially at the commencement of treatment, we have really no other compensatory agent besides friction. If greater activity of the circulation be demanded by the frame, a better oxygenation of the blood, that the more highly organised principles be made to take the place of those low animal products oil and fat, and all muscular exertion be forbidden, there can be only one safe process of excitation left to us—and that is both superficial and deep-seated friction to the whole surface of the body. It is certainly worthy of consideration as to whether the ordinary “rubber” does not oftentimes produce a salutary constitutional change in this direction,—in an *impromptu* manner, as it were. But, be this as it may, if muscular activity be desirable to produce these physiological results, the ground-work may be with more safety laid by friction.

A very good case, illustrating the value of friction in such diseases as cholera, is given in the "Gazette des Hôpitaux," for June 22nd, 1854. The patient was a Madame Berthan, aged 49, of nervous temperament. The physician found her in the following state :—"Face, hypocratic and blue; no radial pulse; suppression of urine; abundant and copious evacuations, which passed involuntarily; frequent vomiting; cramps so intense, that they aroused the patient from her torpor, and made her cry out; the skin, having lost its elasticity, retained the folds into which it was thrown after the cramps had subsided. The body looked like that of a skeleton." Treatment :—for half an hour, the spinal column was rubbed with oil of turpentine, and then the entire body. Twenty drops of the oil in warm water were given internally: then every quarter of an hour this was continued, till it was in a red glow. Towards evening there was a marked improvement in the warmth of surface, the pulse exhibiting both frequency and power. The skin was of a red coppery colour, and there was some animation. The patient stated subsequently, that at the time she had no consciousness of what had passed; the evacuations diminished both in amount and frequency. The frictions were continued, and a solution of gum arabic used abundantly, to distend the canal. This case terminated favourably, and there were many such at the time to prove the value of this agent.

There is another process which, though not exactly similar, nor equally useful and universal, is yet a very serviceable companion to *friction*, namely, *percussion*.

We have from our earliest infancy full experience of the moral suasion of *percussion*. The smart slapping over the *nates* to excite vital action, is an instinctive remedy of very remote antiquity. What objection, therefore, can there be to the percussing of a knee-joint? . One of the most recent and

respectable authorities among those who have written on this subject is Dr. Gower, in years gone by one of the principal physicians to the Middlesex Hospital, and who suggested an instrument for the purpose, which he called a “pulsator,” to be used for “*mechanically propelling the too languid circulation of the fluids.*” He was correct also in declaring that this had been an established practice since the days of Hippocrates, and clearly traceable among different nations under such guises as the Eastern *shampooing* and the Egyptian *massing*. The instrument proposed by Dr. Gower has the appearance of an auctioneer’s hammer, the head being made of cork, and the handle of wood ; it is not, therefore, an instrument likely to excite any terrors in regard to its effects in the minds of the most fastidious of patients. The origin of its invention is due to a view of the matter which seems to us very just and reasonable, for it is found that although percussion can, in ordinary cases, be administered by no better instrument than the human hand, still the latter is often too superficial in its action. To reach parts deeper seated, there is no instrument like the “pulsator,” and it has moreover the advantage that it can be used by the patient himself. In *rheumatic* cases, where local deposits are largely seated, it would be almost in vain to depend upon percussion with the hand ; and here the “pulsator” would be invaluable, the only requirement being steady and long-continued perseverance.

Among the most striking examples of success, following equally striking perseverance with a remedy of the kind, is that of Admiral Henry, who many years ago published a pamphlet, in which he states how he cured rheumatism, a tendency to gout, tic, cramps, and other disorders, and even an incipient cataract in one eye ! The pamphlet contains engravings of the instruments invented and used by him for

the above purposes. It was printed in 1816, just thirteen years before his death. The admiral first commenced instinctively to restore mobility to the muscles of the thigh which had been broken by a hawser. He tried his plan very gently at first, till, emboldened by visible improvement of the limb, he persevered, and with entire success. He began with wooden instruments, but finding that these excoriated the flesh, he substituted bone, as being softer and more pliable. The results were of so decided a character, that it led him to employ the same measures in all sorts of aches and pains. His manipulations were then assiduously applied to a variety of parts of the body ; among them we find him working with silver instruments, and even old tooth-brushes in the mouth, under the tongue and the roof of the mouth, whenever there existed any swelling of the uvula, throat, or tongue. The entire scalp, especially the occipital region, was frequently rubbed or scraped with the bone instrument, as it appeared to him to "harden" the head, enabling him to put aside his double flannel nightcaps, and only wear a single one in the coldest weather. The arms and hands were treated in the same manner, and with as much force as they could possibly bear.

When he first attacked those parts, the skin, as we may well suppose from the unnecessary violence used, became discoloured, but in a fortnight it was entirely well, and was never afterwards so affected. Whenever he found a part painful he commenced upon it till all the pain and stiffness were gone. He states that after the morning operations he was better throughout the day than usual. In 1782 he had so violent an attack of *rheumatism* that he could scarcely crawl about, and became quite a cripple, with pains all over his body. For three years, night and morning, he worked by percussion upon his fingers,

knees, and instep; for gout was in his hands, the fingers swelled and were contracted, the middle finger being so stiff that it was impossible to move it: these conditions were completely removed, and the fingers became quite flexible. In the cure of the *cataract* in his left eye, he declares that during two years he exercised *pressure* with the round end of a glass vial, the sight gradually returning, exhibiting at first a mere glimmering of light. Two years after this a cataract formed in the right eye, which for speedier relief was operated upon; but, inflammation ensuing, the eye was lost, so that he points with pardonable enthusiasm to the fact that but for the cured left eye he would have been totally blind. In the attack of tic, accompanied as it was by loss of sensation round the eye and temples, he seems to have applied his pressure and friction in the neighbourhood of the supra-orbital nerve, for a few minutes at a time, till the pain ceased, and never afterwards returned.

It was in 1787, five years later, that he was induced to apply these means to his knees, ankles, and insteps, which were all much swollen and hard from rheumatism, and very painful to the touch. He used the *hammer*, like the *pulsator*, to the soles of the feet and flat parts, and the bone instruments to the cartilaginous parts, till they became perfectly sound and well. Thus he freed also the sheath of the tendo-Achillis by percussion; and he offers the suggestion that perfect use of a limb so stiffened may be acquired by striking the hams and inside of the knee against the corner of a chair sat upon, with great violence. In his own case the stomach and bowels were hard to the feel, painful when touched, and often disordered, but by working in bed with the bone instruments rounded at the end, pressing and kneading the bowels together till the instruments almost seemed to meet, pressing about the *umbilicus* also, in this way, he says, the digestive functions became much im-

proved, so that he could digest almost anything. In like manner he also attacked the sternum, clavicles, and maxillary bones, to prevent either premature ossification or gouty deposit.

His system of diet was also peculiar. For breakfast and dinner he ate anything placed before him, but only milk and bread for supper. He took half-a-dozen glasses of wine with his dinner, followed up by water to counteract, as he thought, its effects. The result of all this apparently severe regimen—for he rarely used the percussions oftener than a short period night and morning—was yet so evident that we gladly include these long details in our list of mechanical measures of treatment, though the statements are those of an unprofessional witness.

At the age of eighty-five he declares that he has all the activity of youth, has gained the mastery over the disorders with which he was originally afflicted, and felt himself in as good a state of health as any man in England. In Maunder's Biographical Treasury, we find the following notice of the same individual:—"John Henry, Admiral of the Red, who for some time before his death was considered the oldest veteran in the British Navy, died in 1829, at the age of ninety-eight. This venerable officer entered the service in 1744, was in the whole of the American war, and also in the war with France, from its beginning, in 1793, to its termination." Thus from the time when he was first severely attacked and crippled with rheumatism, until the day of his death, a period of forty-seven years intervened, and at the time of the rheumatic attack he was in the *fifty-first* year of his age, so that these two circumstances combine to give more than ordinary importance to the case.

The remarks which will be found elsewhere on *pressure*, bear equally on the safety of *percussion*, so far as the tissues

are concerned. These depositions, such as the Admiral removed, are moreover generally to be found in parts which are either incapable of movement, or in which movement has been suspended by inflammatory action at the commencement of the attack, and where they would long remain in that condition were not external artificial measures put into force till Nature once again resumed its functions, and permanently established the powers which were lost. Just as the disorders of sedentary life may be remedied by their contraries, so the mechanical stoppages, as they are termed by one writer, are induced either by the absence of habitual exercise of a part, or through the contractions resulting from constant pain of a part. A Dr. Balfour, of Edinburgh, many years ago drew attention to the value, in cases of *gout*, of *percussion* upon the soles of the feet remote from the seat of pain, and this we have found useful in addition to the plan pursued when employing *friction*.

It remains, therefore, to say that such an instrument as the "pulsator" may be used in cases of deep-seated mischief; and in those of a more superficial character, the palm or side of the hand may be employed in a sharp and brisk manner, giving rise to no pain or unpleasant sensation, but the contrary, even in severe *gout*. Where inflammation is present, the only caution needed is that it be not applied *locally*, that is, immediately upon the inflamed surface, yet vigorously pursued as soon as the latter is subdued; and there remains but to add, that the objection to such an agent as percussion, founded as it is upon the seemingly undue length of time which any remedy, however permanent its effects, can expect at the hands either of practitioner or patient, is solely owing to a misconception of its character. Percussion is slow because it is not *motion*, nor a strong excitant to motion, but a means of excita-

tion to prepare the parts for motion. Viewed then in this light, it may also be considered a means of cure where no other known measures have hitherto been found to be of almost any avail.

In cases of *muscular rigidity*, the before-mentioned means can be resorted to, especially where it is impossible to bring the muscles into active or passive movement by means of any apparatus with weights adapted for the purpose. This rigidity, usually the product of inflammation, should not be attacked until the latter has completely subsided. In muscular *retraction*, percussion, where the muscle can be reached, is especially useful, all movement being in this case out of the question till the muscle be again brought to something like tone and fleshy consistence.

Having already explained *five* parts of the gymnasium, the *jutting building of the philosophers*, the *ephebeum*, *apodyterium*, *unctuarium*, and *conisterium*,—the youth's exercising ground, the dressing-room, the anointing-room, and room for sprinkling with dust after anointing, we shall follow out the remainder, partly omitted and partly explained by Vitruvius and others. The place termed the *sixth* part, was a sort of *course*, where they played at lance, quoit, boxing, ball, and jumping, and where Galen describes a few exercises, such as scuffling, boxing, hanging by the hands from ropes; another exercise, by which they stood in the fight with bound hands and feet, and in others openly extended, with which they raised weights in the hands and held them out; of a third, called *halteres*—plummetts; also mock fights, battles with arms. Oribasius declares there were at least six hundred other exercises in the *palæstra*. To prevent misconception, it may be here stated, that the *palæstra*, according to some authors, meant the whole of the gymnasium, though it may more pro-

perly be considered to be all that part of the latter which was devoted to bodily rather than mental exercises. It is evident that all private palæstræ were used for bodily exercises. Plato is almost the only author of repute who differs from this, where he says the palæstra signified a place used for the Taurei or Tauriæ, feasts in honour of Neptune, in which men met for the purpose of teaching, conversing, and disputing. On the contrary, Plutarch assigned its place to where the athletæ exercised, performing games and wrestling, but not running or boxing; and Galen, to where the athletæ exercised, to remove grossness from their bodies. In the latter sense it was evidently received by Hippocrates, who relates how papular eruptions came out upon the bodies of some who exercised in the palæstra and gymnasium. The powder, doubtless of another kind, sprinkled over the floors within and without the palæstra, was to prevent the players either hurting their feet or sustaining damage from falls in wrestling and the like. In some places this powder was evidently very deep, for it is supposed that Galen alludes to the fact of having often witnessed athletæ in danger of suffocation from it. This was, however, the powder or sand of the arena, that of the gymnasium being far more superficial. It was in the palæstra, also, that the orators exercised themselves in the art of declaiming, though some dispute this.

The *seventh* part of the gymnasium was the *sphæristerium*, or place for playing at ball. There were many games at ball, forming exercises perhaps more frequently employed than any other kinds. The *sphæristerium* was set up, in common with other things, in gardens, as in the villas of the younger Pliny at Laurentum and Tusculum, in each of which was a place of this kind, adapted for many sorts of exercises. Aurelius Quctus ordered his physician to superintend the construction

of a sphæristerium and stove, and whatever else might be requisite for his health, in his garden at Ravenna, to which he was yearly accustomed to retire. Here other exercises may also have been used, for Suetonius declares that in such a place Vespasian had the throat or neck and other parts of his body well rubbed.

The *eighth* division was made up of the passages to these places, between the porch and walls. The whole area of the peristyles, or circular range of pillars, was also constructed so as to admit light to the porches and bath-rooms; and for walking about and taking other exercise, which could not be done in parts where the dust was deep, nor in the *xystum* or covered walk, or other parts of the building. They were places that appeared to have been levelled with rubble. In this way, we believe, the "courses" were constructed. The *diauli* were courses with pillars at the ends, in which they ran twice round; the *dolichi*, where they ran to and fro; the same with the *dolichodromi*, a longer kind of the latter; and the *diaulodromi*, where there was wrestling as well as running. These were constructed for several purposes, though, according to Vitruvius, there were no other *diauli* than those around the square of the peristyles, marked out as two courses. In these also they sometimes held the exercises of jumping, and the quoits, which Galen, we think, excluded from the *palæstra*.

The *ninth* part comprised the covered walks or piazzas; but which of the two obtained among the Greeks and Latins it is not so easy to discriminate; for they style the *xystum* the covered porch, where the *athletæ* exercised winter and summer. Of these were some where they walked in the open air, and in winter time, during light weather, they entered through the porch and walked here, and in summer always exercised themselves here. In Vitruvius's work, these are called "ways" or

"groves." They were of two descriptions, one being open, and the other planted with plane and other trees, yielding pleasantness and shade to those who would otherwise have suffered from the effects of the sun. Pliny alludes to them, where he mentions the celebrated plane-trees under which they walked in the Academy of Athens. Walking in these *ways* was evidently more frequently practised than in the *course*. The groves which were pruned in the time of Alexander Severus lest they should break down the structure of the public baths of Nero, were like none other than the plane groves and xysti of the Greeks.

The *tenth* part of the gymnasium was the *bath*, which it is evident, both for enjoyment and health, was held in higher repute than almost all the other parts. Galen seems to have deplored the fact that, till the age of Asclepiades and Pompey, daily bathing had been much neglected. Both Hippocrates and Galen, in their separate periods of existence, regretted there was so little accommodation for public or private bathing. Necessity demanded more spacious buildings adapted to these purposes, and such were subsequently erected of superb marble. There were at the same time built a large number of private baths, of the most magnificent character, such as were described by Seneca, who declares that any person would appear to himself sordid and mean, unless the walls of these baths were refulgent with great and precious things, unless each piece were of the most costly marble, every operation reflected on the burnished walls, the arched dome crowned with glass, and the water flowing in through silver taps. To say nothing of statuary and columns ornamentally arranged, the owners of these baths disdained to tread on other than precious stones. The baths of the Etruscans, so elegantly described, could not possibly have had greater magnificence or more wonderful

profusion lavished in their construction than these private baths of the Romans.

We have somewhat better knowledge of the *baths* of the gymnasium, gleaned from the work of Elpidanus, wherein he treats of the different kinds of baths and their situations, of the setting in order of the brazen vessels in which the people bathed, as well as inquiring into the reasons why they bathed at all, how they bathed, and in which sorts of baths. The ancients undoubtedly possessed a thorough knowledge of all the means of bathing, using oftentimes soft water or collected rain-water, or flowing water, or water heated by a fire, or brought in one continuous stream from another place. Mention is very often made elsewhere of medicated waters in the baths used by the sick or healthy, but not appertaining to the gymnasium, of which alone we intend to speak. Nero, not content with soft water, provided sea-water, and led also that of the Tiber into his baths.

The places appointed for the several baths were called *Balnearia*, of which we find there were many, viz., the *loutron* or louterion, for cold washing; the *cold bath*, the *tepid bath*, the *hot sweating bath*, and the *hot washing bath*. Those things which were supplied to the baths were the stoves or hot-houses, the water-conduits, and vessels; and we can readily discover that all these places were arched, and constructed in the forms we observe in the ruins of the Roman baths. According to Vitruvius, the old edifices of the kind originated by the Greeks became the models from which the celebrated Roman baths were constructed. The cold font or *loutron* was situated in a place where they washed with cold water, and especially in a sort of basin called a baptisterium; and, according to the customs of the nations whose historians and authors we copy, distinguished more as a summer bath than as one of those

used at all times, either for health or enjoyment. Lampridius says, however, of Alexander Severus, that he rarely washed in the hot bath, but often in the font of cold water. According to other writers, there were many uses of this font. The last-mentioned writer says also of Heliogabalus, that he never permitted himself to be washed in the font, unless it were tintured with saffron or other precious juices. Thus the *frigidarium* and cold bath were contrived for those who, immediately after leaving the tepid or hot baths, chose to enjoy the cold air, for no other vessels of water were found there ; and it seems pretty certain that this was not capable of being used for the study of swimming. Some authors make no mention of water in the *frigidarium*.

The *apodyterium* was a dressing-room, or place where the bathers deposited their clothes, and where they might be also easily robbed of them. There they deposited their vestments in order to pass naked into the *ephebiun*, the cold bath, and other places ; whilst often, to avoid the gaze of idlers, it was more desirable to strip in the cold bath. Galen may, in fact, signify this when he mentions at what hour youths should use the temperate bath, because it could be no other than the cold bath itself, in which they cleansed themselves from perspiration. He enumerates four parts of the baths—the hot ; hot washing, that called *loutron* ; cold washing ; and the fourth, in which they wiped off perspiration. It may also be mentioned in this place, that the greater portion of the public baths was so accessible from without that the garments of those who bathed could be easily stolen, and on account of which the law inflicted heavy punishments on the thieves of the public baths, as may be traced in Aristotle. This led to the appointment of servants called *Capsarii*—bath-keepers, and others, who also preserved the garments of bathers from thieves.

The *tepidarium*, joined as it was to the *frigidarium*, was so arranged that those who wished to enjoy the warmth of the air or the water, either for luxury or health, and those who sought to bathe in the cold or hot, suffered no harm in passing from the *apodyterium*, or from the cold to the hot bath, and again from the hot to the cold ; or in passing through the cold bath from end to end. Besides this, they used the tepid for a middle kind of bath, into which they went from the cold, whilst some lingered in the hot places, because there they could receive no hurt. They were always able to do this in the private baths, where the tepidarium and apodyterium were identical, owing to want of space, though sometimes they had in this way better accommodation afforded them. For Cicero, writing of his brother's villa at Arpinum, speaks of it in envy, saying that he provided a dry bath or apodyterium in the other angle of his baths. In this, he clearly points out both a *tepidarium* and *laconicum*, or dry and hot bath, as he and Celsus call them. In the same way, sweating was properly the effect of the former, though we believe they were in reality one and the same ; at least they were so after the time of Vitruvius, for we read that the *hot* bath, or house, or room, called *laconicum* by the latter author, was a room or cell containing within itself no water, but adapted for promoting very copious perspiration ; and from this, some call it the *calida sudatio*—hot sweating-place ; some, the *assa*, or dry place. On the latter score, we find Columella, who severely lashed the prevailing vices of his age, remarking thus :—"Thence we arrive at the agreeable custom of drying-up the daily crudities of our debaucheries in the *laconicum*, and of re-creating thirst by drawing out our perspiration." In this *hot vapour* or enclosed *dry-heat* bath, perspiration was of course provoked, and not otherwise. It was similar to that near the myrtle groves of

Baiæ, where the hot vapour, as it arose from the earth, was received and enclosed in edifices specially constructed for the purpose. These, according to Vitruvius, were places identical in character with the *tepidarium* and *laconicum*. Celsus clearly calls that the *laconicum* where *dry heat* elicited perspiration.

The *laconicum* must not be confounded, as we have said, with the *sphaeristerium*, or place for playing at ball, though both were round in shape, the former something like a vaulted hemispherical tower ; for it would be like "putting oil to the fire" to have exercised in so hot a place. Some reprovèd the custom of copious sweating in the *laconicum*, by which the feet were enfeebled in walking.

After the *laconicum*, follows the *hot chamber*, holding within it a bath of water, in which they washed ; which was the *hot-washing* of Vitruvius. Why this writer makes no mention of the *tepidarii* in the constructed baths of the Gymnasia, while he mentions them fully in his description of the private baths, we are at a loss to conceive. He seems to think the Greeks had no *tepidarii* in their palæstræ ; and though he makes the hot and tepid baths so different, yet in another place he distinctly states that the arched place embraced the sweating, the *laconicum*, and the hot bath. In the Grecian building it is likely the latter was the case.

The condition of the ruins of the Roman baths, and especially of those of Caracalla, has within the last fifty years produced a good deal of confusion as to the ancient uses of the various chambers and buildings to be traced out therein. On this account it may be that some modern antiquaries have given the name of *laconicum* to the circular chamber, "holding within it a bath for cold water." Others view it in the light of a moist vapour-bath, confounding it thereby with the

“Cella Caldaria” (the openings in the floors of which show it to have been a place of the latter kind), whilst the authorities quoted by Mercurialis are very precise on this point, distinguishing the *laconicum* as the place for *dry heat*, and the chamber “with the bath in it,” as a necessary appendage to it, namely, for hot, tepid, or cold washing after sweating.

Some think that the *aleipterion* or *anointing* place, was equally part of the baths as of the gymnasium. In innumerable private baths many of these arrangements were wanting. Yet there were places common to all, such as the *hypocaustum*, or stove, and the furnace, built beneath the hot bath, and the vessels in which water was heated. The fire was tended by servantse called in the Pandects *fornacatores*, or furnace-men, who frequently augmented the heat by hairs or threads dipped in pitch. Plutarch relates that in the using of wood, the ædiles or surveyors of the baths ordered them not to kindle the fires with olive branches, nor to cast dandel or tares into them, because the scent of these produced heaviness of head and vertigo among the bathers. Mention of the foregoing use of hairs is made by Vitruvius, where he enjoins that for the purpose of creating heat they should be strewed along the hypocaustum, so that the flames could more readily wander about under the vault or arching, otherwise they could not be restrained within, but would rise to the mouth of the furnace. This should be clearly understood, lest any one fall into the error of believing the hypocaustum and laconicum to be one and the same. The heat rose from the hypocaustum into tubes which permeated the walls of the bath, and were conducted all round it, warming it equally from the lowest to the highest parts. As to these tubes many vestiges formerly remained in the baths of Diocletian and Caracalla at Rome.

The *Aquarium* was the reservoir of the hot bath, and adjoined it, and a wide channel led into it to supply it with water from the aqueducts ; or the latter was brought thither, as well as into the hot and cold baths, by piping. Not far from this spot was the *vasarium*, where they kept the vessels necessary to the service of the baths, and where water was made hot for them, of which Vitruvius says that the brazen vessels were placed above the fire-chamber for three purposes : first, for the use of the hot bath ; second, for that of the tepid ; and third, the cold ; and were so arranged that in changing from the tepid to the hot sufficient hot water flowed out, and for the cold the same quantity of cold water. Respecting the atmosphere of the baths, he says they were situated in the hottest places, sheltered from the north and north-east winds, whilst the hot and tepid baths had their light in winter from the west. So that it appears the architects of these buildings so constructed them that they should be well lighted up at the eighth hour, and, where the nature of the place prevented, at mid-day. Thus the light gradually declined from the wide hole in the middle of the camera or arched roof, under which the bath was placed. Around some of these baths there were spacious margins or galleries, called *scolæ*, in which, the place being already occupied by bathers, other persons stood looking on and waiting their turn. Respecting the fixed temperature of the bath itself, we have it on good authority,—namely, Seneca and Plutarch—that the most ancient use was of the *tepid baths*, such as the physician Alexander used in fever ; and in which the women of Galatia, bringing pots of porridge into the baths, both washed and fed their children. Nevertheless, in the time of Galen, who flourished a little after the latter authors, the hot baths were by no means in common use ; and what is more, the manner of

using them was by no means similar in all the hot baths, though we now know little of it. Seneca says, that it constituted one of the most honourable functions of the *ædiles* to enter and inspect the bathing-places fitted for the public, and see to their cleanliness as well as *healthy temperature*. But in his own day this custom had fallen into disuse, whilst the same kind of baths were made so hot that persons were induced to bear the great heat by salt being placed under the tongue,—at least, so Pliny affirms.

The vessels in which they washed, were either moveable or immoveable. Those which were made with tiles, marble, and pipes, were arranged for washing in the hot baths, and these were used in the construction of the *baptisterium* for cold water. They were also sufficiently large to enable the bathers to swim in them; and there were once vestiges of these in some of the ruins of the Roman baths. Those that were moveable were used in the private baths, and sometimes in the public, though we think they were to be found chiefly in the private baths. They were also of different figures, some square, others between square and oblong, others round, others oval, as appears from some of the most ancient relics to be met with in Rome. We give an illustration of one form of them in the frontispiece, which will explain many things to the reader.

They were likewise of various material, some of stone, others of marble, others of brass. Some persons tried to make fonts for the baths of wood, and even out of rhinoceros' horn or ivory. It was also the custom in time of war to carry a bath for the accommodation of the weak, as is conjectured from the language of Paterculus when praising the means of cure of the sick soldiers of Augustus; considering the bath, to those needing and desiring it, by no means the least

in importance. We may add, however, that some think the allusion to the rhinoceros' horn was merely a term of reproach. We know, in fact, little of their uses of the bath, beyond the necessities of cleanliness. Some bathed only three or four times a month, and others used the bath daily. The latter was especially necessary in the gymnasium itself from the accumulations of dust and perspiration. And for this purpose the first Roman gymnasium was established close to the Tiber.

CHAPTER IV.

Description of the public Baths continued—A modern “Turkish” Bath in Egypt—The different Functionaries of the Gymnasium—The *Medical*, *Warlike*, and *Athletic* Gymnastics.

IN subsequent times to the foregoing the majority of men used the baths for luxury and comfort, especially the *tepid* baths, with which they soothed themselves both after exercise and the effects of the sun ; or “tempered” the hotter parts of their frames with cold water. Not only were soft but even medicated waters in luxurious use among them, as Galen has asserted in his principles of using local remedies. With regard to bathing, it was also the custom that no one should partake of food unless well washed ; and not only in some cases with warm, but even in sickness with very cold water, as we learn that the Emperor Titus perished through the carelessness of those who attended him during his illness, for he expired, it is said, when placed in a tub filled with snow. By warm bathing the weak stomach was enabled to digest food ; to corroborate which, the physieian Posidonius relates its being done to assist digestion ; and Pliny affirms that not only was digestion visibly improved by the warm or tepid baths, but the bathers appeared not only not weakened but rather strengthened by them. The temperature of the bath in the latter cases, we think, should be regulated by each person’s experience ; some both requiring and bearing more heat than others.

Therefore, it may be said of the ancient baths that they had *four* special uses:—first, for washing the body; second, for warming it; third, for health; and, fourth, for pleasure. The majority of hot baths were used for removing lassitude, whilst they softened the body; on account of which, they were styled by some *anthropagnaphia*, or “man-fullers.” Both the hot and tepid were used to induce sleep. They washed also in the cold for pleasure, or to render themselves more robust; and very probably for the latter purpose resorted to it after the hot baths. The honour of being the first to show the benefits of cold bathing is divided between three persons, namely, Euphorbus, physician to King Juba; his brother Antoninus Musa, physician to Augustus; and Charmis, of Massilia the modern Marseilles, who condemned the use of hot baths, and exhorted his patients to use cold bathing, even in the winter time, and himself immersed the sick in cold water: of which plan Seneca approves, calling it a refresher of spirits. It was thought, though erroneously, also to aid in the prolonging of life, and many other advantages were, in their opinion—as we know well in the present day—conferred by cold bathing. One author states that many persons who suffered from sickness after supper on account of the heat, were wont to go into the cold bath, and passed a delightful night after it.

The prices of the public baths were very low. Youths under fourteen were charged nothing, and the small price, namely, a *quadrans*, led Seneca to style the bath “a farthing thing.” About the latter coin there has been much dispute, some writers considering it equivalent to our halfpenny, others averring it to have been scarcely more than a farthing. The as, or pound, from which the *quadrans* was taken, was valued according to weight. The “*quadrans*,” or fourth part of the as, was a piece of three ounces, stamped with several devices;

amongst others an open hand, a strigil, a dolphin, &c. If ten asses were equal to a denarius, which was worth about eightpence-halfpenny of our money, a "quadrans" would then be something very small—a fractional part of a farthing. This was the common price ; yet Antoninus Pius constructed baths for the people without payment. It was the law that they should be open to strangers, and that, because of so low a price, no sorts of men whatever should be driven away from the public baths. Young boys, old men, cripples, nobles and commoners, bathed in them ; and, amongst the rest, teachers of elocution, harpers or singers, public criers, tragedians and comedians, were wont to frequent the baths, because, having lost their voices, they were thus cured by the moisture or steam of the soft or sweet waters, and restored to health. Martial seems to allude to a circumstance of this kind in some verses addressed to Menophilus, a comedian, who often bathed with him in the common baths of the thermæ. That the women bathed promiscuously with the men there is no proof, at least so far as the sanction both of law and public opinion was concerned. On the contrary, we find that among the Greeks the baths for the women were distinct from those of the men, both on the score of morality and to escape infection ; whilst it was laid down in the Roman law respecting education, that it was lawful neither for parents to bathe with their children nor a father-in-law with his son-in-law. In the more depraved and degenerate days of ancient Rome there doubtless was much promiscuous bathing among the sexes ; but it appears, on the other hand, that there were edifices in which the two baths, separated for the sexes, were yet included under one roof, as in our own country. In one of the orations of Caius Gracchus it is distinctly laid down that modesty did not permit of the sexes bathing together, but as

it might be desired for the sake of association, as in edifices already described. To judge, however, from Martial and Juvenal, in their day the women both exercised and bathed without any shame with the men. It was on account of this that the infamous Clodia, exposed publicly by Cicero, obtained from the common people the nickname "Quadrantia." Alexandrinus says that there was but one bath-master both for the men and the women. This was in the time of Antoninus and Severus. And Cyprianus has still more pointedly declared the fact, where he says:—"But what of those who enter the promiscuous baths (prostituting their sacred bodies to the lust of curious eyes) for modesty or chastity? who both see and are seen by naked men, whether or no they stand apart from the vices of the latter." There is an epistle extant of Hieronymus, addressed to Læta, on the management of daughters, in which this practice is denounced. To their honour, we find that several emperors endeavoured to put a stop to these practices. Hadrian desired that men should be bathed separately from the women, and Marcus Aurelius also destroyed the promiscuous baths; at the same time Severus prohibited their restoration after the manner of his predecessor Heliogabalus, in whose reign of course such corrupt proceedings met with imperial favour. Subsequently a severe law was decreed, that women should keep away from the public baths, under penalty of divorce and forfeiture of dowry, which was afterwards engrafted *in leg. fin. titul. de repud. et in authentica de nuptiis*. For this reason we find that women built baths solely for the use of their own sex; such as those of Agrippina, the mother of Nero; Sabulla, Ampelide, Priscilla, and others, who had them raised on the other side of the Tiber, in order to ensure greater privacy.

Seneca is certainly rather severe on some of the ancients,

where he says of their ablutions, that "they washed their arms and legs" daily, and the whole body on market-days (*nundinis*). But after Pompey's time, daily ablution was more frequent. It is supposed that even before the time of Homer the hours observed by many were those a little before taking food; but in Galen's time there were not wanting those who also bathed after eating, whence he narrates that he observed such people suffer from rigors, though without fever. The more ancient physicians rarely alluded to this practice of bathing after eating. The greater bulk of the freedmen first exercised and then entered the baths, whilst some bathed without exercising at all. After the game at ball they were wont to bathe, for when the hour of opening the baths approached, which was made known by a bell, the players at ball, and those engaged in various exercises, immediately ran to the spot. Some washed in the closed baths, that they might not get any of the dirt of the players. Before the time of Alexander Severus the baths were never open before sunrise, and were always closed before sunset; but the Emperor himself allowed oil to light the public baths, by which means they were opened in the night. There were, doubtless, other times for washing in the day; but the chief hours for bathing were those from noon till evening, of which there could be no hour more suitable than that before supper. It was thought that few, except the sick, were bathed before this hour, as we may gather from some remarks of Cicero, in his Epistles to Atticus, of the daily life of Julius Cæsar. It seems to have been the custom of the latter to see no one but his lawyer till about the seventh hour, from which time he walked on the sea-shore, and towards the eighth hour he entered the bath; was then anointed, reclined awhile, took an emetic, and was then ready for any amount of eating and drinking; or, as the ancient writers put

it, he could eat and drink with pleasure and impunity. Cæsar did not, however, perpetually follow out the same principles of living; but it was a precept of the physicians, that when filled to repletion with various kinds of food persons should vomit before going to rest. This rule of vomiting was derived from the Dietetics of the Greeks, relating not only to matters of human food but to the evacuations.

The foregoing is the most interesting matter that has been furnished respecting the baths of the gymnasium, as well as the private baths. A good deal of merit was certainly due to Asclepiades, in Pompey's time; who, brought up as an orator, yet making no great gains from that occupation, betook himself to the study of medicine, in which he soon acquired great honour and authority, by the allurements (*blandimenta*) with which he cured the sick, and imparted vigorous health to many; whilst he made great noise at Rome, on one occasion, by rescuing a person from actual burial whom he knew to be alive, or in a "trance," and restoring him to his friends.

An interesting description of a modern Turkish or Roman bath is given by Mr. Hoskins, in his "Winter in Upper and Lower Egypt," published in 1863. At page 140, he says:—"The exterior of the building is not remarkable. The first room we entered was an octangular chamber, formed of lofty arches of brick, and a kind of stage on one side, ornamented with two fine antique pillars brought from some ancient edifice. In the centre of this room was a large stove, elevated three feet from the ground. From this room we passed into a small room, moderately heated; and there we undressed, and wrapped round us a couple of napkins. Thus equipped, the slippery floor requiring assistance, we were led into the bath, a very large room, ornamented with arches supported by pillars.

“In the centre of the room, as in the first chamber, was a stove, or sudatorium, on which we laid ourselves full length, and men, with no other covering than a napkin round the loins, set to work scrubbing us with a brush in grand style. In the centre of the sudatorium was a fountain, which threw out a jet, a few feet high, of hot water, which was continually poured upon us. After this operation we had a kind of sherbet presented to us of hot sugar and water, and the sheeshah (or water-pipe), a delightful kind of smoking.

“The barber then appeared, and trimmed our whiskers, moustachios, and beards, and, without lathering them, shaved our heads. This was accomplished very adroitly, and in a very short time, the heat of the bath moistening the hair, and rendering the operation easy. In two minutes, at the most, after the word was given, my thick crop of hair was strewed on the floor. Of course, those who do not wear the tarboush, or turban, and oriental dress—unnecessary in these days—would not part with their locks.

“After this operation we were led to a small seat, in the same room, and most thoroughly lathered with soap, rather a painful part of the process, as it is impossible to keep the eyes so close that the soap does not enter. The man then threw on us an immense quantity of exceedingly hot water, the effect of which was extremely luxurious.

“We were then led into the room where we undressed, which we found rather chilly after the extreme heat of the sudatorium. We reposed on beds with clean sheets prepared for us, for about an hour, a man all the time kneading us with his fists, and twisting our fingers, legs, arms, &c., the latter operation rather painful for the moment, but afterwards productive of a delicious thrill. The barber then appeared again, and trimmed the nails of our hands and feet. At intervals,

during these operations, we took cups of coffee, and a few puffs of the water-pipe.

“The peasants pay one penny for the bath, and others more, according to their rank; to have the bath to ourselves, and the barber, clean linen, café, pipes, &c., cost us one shilling and ninepence each, but would have cost us more had it not been Ramadan, and before sunset, the usual time in that month for taking the bath.” This bath was taken at the ancient city of Lycopolis, on the banks of the Nile; a city containing about 25,000 souls.

The *eleventh*, and, in fact, the remaining part of the gymnasium, was the stadium or public course, where people witnessed with ease the athletic sports. It was constructed like a hemisphere, with many steps, whence the spectators, who always flocked thither in great numbers, could be well accommodated and behold the games. Between it and the xystum, or by a wall intervening between it and the runners, and thence through the entrance by the plane-trees of the gymnasium, the *athletæ* entered the arena of the stadium. These edifices seem all to have been enclosed by walls from each other; and especially in those parts of the building in which were to be found the timber-yard, rooms for the furniture of the baths, the *triclinia*, and many other places. They are said to have used charcoal drains. Taverns also were constructed near the baths, where those who felt weak, either from excess or the unsuitableness of the baths, might more immediately refresh themselves. Pliny doubtless alludes to this, when he speaks of the couches in the taverns near the baths.

Partly in consequence of the excessive use of the bath may have been derived the custom of lying down at supper, which custom followed the Romans to the East, and has given rise to much controversy as to whether our Saviour sat or reclined at

table, some authors fairly urging that, had he not reclined, Mary could not have applied the ointment to his feet. Supper was the chief meal of the day. The females, except in the domestic circle, reclined apart from the males; and according to the Roman marbles, they appear more in a sitting than reclining posture. They reclined chiefly on the left side, in order to use the right hand more readily; but when satiated, they turned round, and assumed almost or entirely the supine posture, and thus entered into more general conversation. In this position, as Plutarch relates, Sertorius fell more readily under the daggers of the conspirators who supped with him, and at a given signal rose and murdered him. Three was the usual number for each couch, for a sort of law existed that the number of guests should not exceed nine or be less than three; thus bearing out a common proverb, which said, "seven for a feast, nine for a brawl." By this arrangement the servants could more readily proceed with their various duties in attending on the guests. Thus they sat at these feasts in cool apartments open above, yet the opening covered with silk or linen, to prevent dust falling either upon the visitors or the viands spread before them. Various were the means to drive away pains in the head arising from their debaucheries, the chief of which was the binding their temples with linen or linen bands. It is conjectured that in very early times they drank out of bull's horns, their wine being mixed with water; whilst the horns afterwards used were of gold and silver, with which the guests were wont mutually to pledge each other. The custom of lying down after the baths seemed as necessary as the food which followed, and with the common run of persons there was habitual drinking, for they, after bathing, snatched up their clothes and ran off to the adjacent taverns; as we have already mentioned. The excesses of bathing, not

the moderate use of it, will ever give rise to abuses of this kind, both degrading and ultimately destructive of the vigour and permanence of a nation. Among the Romans, the artizans must have usually sat at meals, for it is said the common people did not sup lying down, except on sacred days, on which days also they usually frequented the baths. At the better class of feasts nothing was omitted that could gratify the mind; festive discourses were invented, various kinds of music were selected, and odours of the most precious ointments exhibited, with chaplets and masses of flowers, pleasing the eyes and nostrils, and in some cases inducing sleep. Their viands were equally select and costly, and this in great measure arose from their habit of making one really great meal in the day. There was, to a certain extent, very good reason for this institution of supping largely late in the day, for it would be both injurious and impossible to exercise the body or perform much mental work after so considerable a meal. Yet we are told Cicero and others transacted, by correspondence through tablets, a good deal of business at these periods of the day. But from this digression we must return to more important matter. Like many other ancient arts and sciences, the materials of gymnastics have been scattered, and ultimately lost, so that although we have plenty of writers who allude to the matter, we yet have little of a practical character to be derived from them. It is, nevertheless, an art to which great kingdoms, since passed away, owed the chief part of their greatness, as well as the excesses and ruin which followed. We have next a few words to say on the functionaries of the gymnasium. Among these, the first in order was the *gymnasiarch*, or chief teacher, whose office it was to preside over the entire gymnasium, and, as the chief, to arrange all things, to prescribe the times and hours, to issue orders, and, in fine, to

take especial care of every matter which the rulers of public establishments usually took cognizance of. He was there early and late, and from his place directed the young men and youths, and if any transgressed, he was wont to admonish them with great authority. The second to this personage was the *xystarches*, or master of fencing and wrestling, who was present in the *xystum* and *stadium*, in fact at all the exercises of the *athletæ*. This is to be gathered partly from an inscription on the base of the column of Trajan in the old Forum at Rome. From it is to be learned also, that there was a different prefect for the contests. Galen speaks of the *pædotribes* being only masters of the wrestling, whilst the *xystarches* was manager of most of the exercises, and was the judge of victories and regulator of prizes; and Hippocrates called him *palais-trophulus*, or prefect of the *palæstra*, because he not only wrestled or contended himself, but also had care of the *palæstra*. It is probable, however, that the *agonistarchus*, or master of wrestling, was the prefect of the public contests in the amphitheatre and gymnasium, where the well-trained *athletæ* brought honour to him; mention of which is made in an inscription of the time of Marcus Aurelius.

Next to these came the *gymnasts*, or masters of the exercises of youths, whom Galen considered as understanding the strength and power of those exercises which conduced to health, in what manner or when they ought to be done, as in the daylight; as well as to whom they were suitable. In the same way he also instructed the *athletæ*, and all the other exercisers, in what had really a medical bearing, and what were equally medical in many other respects. So at least we may gather from Plato, that if any person did not wish to retain a sick or infirm slave, he was sold on the authority not only of the physician, but of the *gymnasiarch*, both being supposed

equally capable of discerning decay from health. Many other writers also think that both were authorities to discern and search out the peculiar nature of man. It is incorrect, therefore, to confound these with the pædotribes, notwithstanding the variety of opinion on the subject, and even of Galen, who, nevertheless confesses, in his advice for the treatment of an epileptic youth, that in his time the rude and dull pædotribes were selected from the most ignorant of men. Next, there were the protogymnasios, as some were called, who exercised together. Then the *aleiptei*, or *iatrালেiptai*, so called from *aliptes*, an anointer. Celsus says, that a healthy man should be under no restriction of regimen, and require neither a physician nor an anointer, though he did not include the proper use of gymnastics. Cicero considered that he owed as much of his health to his anointer as he did to his physician. By many, likewise, medicine was esteemed necessary to health, but a good habit of body came from the anointing. Next we may consider the pædotribe as a sort of inferior gymnast, who carried out, but did not prescribe, the requisite exercises. He is described as standing in the relation either of a common soldier to his captain, or a compounder to his physician, merely carrying out the instructions of one or the other. This made Galen declare, in his remarks on the treatment of an epileptic already alluded to, that he had great difficulty in finding a prudent or careful pædotribe. Thus, the gymnast was the principal officer in carrying out the exercises, and the pædotribe was the operator or servant. In the time of Homer they did not exist under separate names, because, as we show elsewhere, the seed of the gymnastic art only appeared in those times; nor was the art reduced to rules and forms, nor were there either masters or workmen.

There were present also the *spheristici*, or teachers of those who played at ball, and those *pædotribes* who were skilled in all the movements of the ball, or at least knew how human bodies were affected by that exercise. Also the servants who were wont to rub the bodies of the exercisers according to the orders of the gymnasts, sometimes with naked hands, sometimes with ointments, sometimes with napkins, rubbing in various ways and degrees—hardly, softly, or moderately,—were there. After these came the *reänointers*, so called because men were anointed both before and after exercising, and some called these, though incorrectly, *iatrালেiptes*. The *mediastini* or slaves also ministered in the gymnasium, such as in sweeping the floors and executing many other duties in its service. There were other servants of the baths, such as those who washed the bathers with hot dry sponges, dyed purple, and then dried them with linen, which was the same as cleansing the body after exercises with strigils, and removing external accumulations. There were next the *pilicrepi*, a kind of stokers, who supplied the pitch balls that the fire of the baths might not be extinguished. The *Alipili* were those who (as Seneca mentions) applied themselves to plucking out hairs from different parts of the body, and especially from under the armpits. This was their office, unless we consider, as it has been suggested, that both the *pedicrepos* and *alipedos* were employed in the gymnasium to purge the skins of men of creeping companions, and amid the general slaughter to announce each kind with a loud voice, so that Seneca was vastly offended at the noise they made in this way. Certain it was that they plucked out the hair from the armpits, and the mode in which the operation was performed was by tweezers. Resin was also used in aid of the process, and this method of ridding the bodies of men of what was thought a superfluity of hairy

covering obtained considerable repute. The ointment used was called *psilothrum*.

The magistrates and censors of public morals among the Lacedemonians sometimes warned the people both by law and edict, that they should not bring pitch into the baths, lest on exploding it should take off their hair. There were also the *janitores*, porters of the gymnasium; the *fornacatores*, or furnace-men, of whom we have already spoken; and besides, there were vendors of various articles, who haunted the gymnasia, to satisfy the appetites and requirements of those within. Among these we may enumerate the *libarii*, cake makers, selling honey-cakes; the *botularii*, sausage makers; and *crustularii*, pastrycooks. And because there were often casualties among those who exercised, such as wounds, contusions, sprains, and luxations, we believe there were appointed physicians, who were at hand morning and evening for any emergency that might happen, and for attending the sufferer, as in the public games or spectacles. From the marble inscriptions found in Rome, it would appear that there were physicians for the morning games, and the same for the great games. As to which were the morning and which the evening games, we find that the spectacles which were made for the people and given publicly to those of the city, were partly in the morning, and partly after dinner. In the morning were held contests of wild beasts with each other, and between men and wild beasts; after dinner, men who entered to fight with each other. The kindred of gladiators often found a reward in the historical records of the prowess of the deceased; and those who contended with wild beasts were called *bestiarios*, whilst the gladiators generally are called *meridianos*. This is easy of comprehension. For the noon-day spectacle was called the great game or contest, whilst the greater portion of the

spectators flowed in to see the contests of the men in preference to those of beasts, as many writers avow that the people delighted to run, *as now*, after these homicidal spectacles.

It is to be concluded, therefore, that the gymnasia had all these ministers or servants, viz.:—the gymnasiarch, the chief of the whole place; the xystarches, master of the athletæ; and the gymnast, the prefect or governor of all exercises, who possessed perfect knowledge of their capacity for health, the mode and the time in which to use them, with other matters. Subject also to the gymnast were many servants, such as the pædotribes, who worked in the palæstra; the ruler of the games, with the exercises; and, as before mentioned, the sphæristicus, teacher of ball-playing; the fricator, or rubber, rëunctor (reanointer); mediastinus, or slave; pilicrepi (stokers); alipili, who plucked out the hair with tweezers; janitores (porters), and fornacatores (furnace-men). But the time when the games of the gymnasia originated in Rome does not clearly appear to us. We are told that on the death of Socrates the public gymnasia of Athens were closed, by reason that the Athenians repented of his death. And it is worthy of note that gymnastics were divided commonly into three kinds.

The whole of ancient gymnastics may be resolved into *three* kinds, viz.:—the *medical*, the *warlike*, and the *athletic*. Now, although all of these have much the same character and bearing on the human frame, still they differ greatly in their ends, for the sake of which they were obviously thus separately instituted. For the simple gymnastics, as a part of medical science, is the only one used as a *curative* measure. Plato, who was sent into the gymnasium by his parents at an early age, very wisely declares that *moderate and not over much exercise produces a good habit of body*. By moderate and moderated exercises men are undoubtedly not only kept in

health, but are protected from the inroads of disease. This was also the decided opinion of Galen, who is the best of ancient authorities on this subject.

To the *warlike* exercises, men and boys chiefly devoted their attention ; yet it is said that some women were strengthened and improved by these exercises, so as to bear themselves bravely in war, to repulse the enemy, to defend their country, and to deport themselves skilfully as soldiers ; at the same time they were acquiring a superior habit of body and preserving their health. Yet this form of exercise, as its name implies, appears to have had no other origin than that men should carry on their wars with greater vigour. To this we might add the most abundant testimony of Plato, who in that portion of his writings wherein he discusses the points relating to the education of youths and children, wishes that public masters should be appointed, who should teach gymnastics to boys and girls, and that military skill could not be better produced than by the gymnastics of the *palestra* and the *dances*. Aristotle follows in his *Politics* in the same strain, indicating these warlike gymnastics by certain expressions used to show that the *bodies of youths were sometimes deformed by the practices of the athleteæ*. This, we know is most liable to follow excessive exertion in exercising, and it is so on account of the *comparative* character of bodily exercise, so far as individuals are concerned. He reprehends the Lacedemonians for making their youth wild and frenzied by such over-exertion, and advises that the then existing gymnastics for boys should be milder, and even more gentle exercise given to the robust, so as in every way to render either more fit to engage in war. Those also who directed all their efforts to acquire skill and aptitude in war, earnestly exerted themselves also in the work of *medical* gymnastics, as the latter in fact agreed with and

prompted the *warlike*. And that the art was esteemed of great price, Vegetius, in his work on military affairs, most clearly shows, where he explains to how large an extent both the Greeks and Latins carried out their military gymnastics.

In the statistical and other reports of the Medical Department of the Army, presented to Parliament in 1857-8, it is stated that a close analysis of the diseases and deaths among the military (the Guards, for example, who were all picked men), and among the classes in civil life, does not justify the conclusion that it is to their vicious lives, rather than the vicious system under which they live. This refers to the bad lodging, food, &c., and to the sanitary condition of the barracks where the soldiers pass their "monotonous, inactive lives."

Among the causes of sickness and mortality of the infantry, the Commissioners place want of exercise, such as useful labour ; and recommend that every barrack should contain workshops. The one dish to cook all the year round is at length remedied, and in the year 1861, the Commander-in-Chief issued a general order for the establishment of gymnasia in the barracks throughout the kingdom. Is it not idleness and food that destroy our officers and men in India and elsewhere, rather than climate ? Ask Indian officers of rank if this be not so ?

Besides these, there is the common form of gymnastics which Galen calls the *athletic*, from which, by making men stronger than they were by nature, they gained repeated prizes at the Olympic Games. Such was Milo of Crotona, an athlete, who for some time was a pupil of Pythagoras, and is said to have obtained a piece of land as a reward of success at these games. By different authors the latter are called *gymnastic contests*, the *sacred games*, the *gymnastic games*, and

the *gymnastic art*. In this way were celebrated contests in honour of the gods, or the *sacred contests*, and those engaged in them were styled *athletæ of the sacred contests*. Yet they were variously styled, according as they were performed in the amphitheatres for the amusement of the people, in the gymnasia, or in other public places merely for the sake of exercise. All the men who so engaged were ultimately called *athletæ*, and those who fought bravely received the *athla*, or rewards of the contest, which of course led to incredible misery among these men. Those who trained for war were not necessarily *athletæ*, they come under that simple designation. There was a most decided difference in the matter. The wrestlers and others were all day long practising their art, were gross feeders, devouring large quantities of flesh, and did not acquire the same graceful and perfect habit of body which was well established in those who strove to obtain excellence in military movements. Thus, while the *medical* and *warlike* gave both strength and health, the *common* or *vicious* gymnastics gave strength, but not health; for the mere unwieldy habit may denote robustness, but rarely health. Yet a few words more on their *athletic* gymnastics.

On the latter subject Galen claims to be the highest authority. His custom was to rail violently against them, and with reason. The vile practices to which they led destroyed the gymnastic art, and Galen's voice, raised at first to check abuses, became at length the knell which heralded its downfall; and with it gradually disappeared the once great physical pre-eminence of the nation. Galen had originally been the master or governor of a gymnasium, and with respect to the "vile" gymnastics of the gladiatorial crew, there is great wisdom and justice in his remarks and those of other writers, who expose in all their gross characters the wretched manners and condition of the "profession" in those days. For all the corruption and

depravity that ensued from this bad portion of the art the God Hercules seems to come in for the chief share of blame, and justly so. Galen distinctly says that these men had too much heaviness of body and comparative robustness, whilst the mind was heavy and all the senses rendered dull, torpid, and sluggish. Plato has also called the *athletæ* sleepy, dull, idle, slothful, giddy, and at the same time diseased. Hippocrates, detesting in every respect the obnoxious and dangerous callings of the *athletæ*, dwells upon their great disorders; whilst Plutarch likens them to the stones and columns of the gymnasium. Yet it is confessed that among the Greeks, nothing tended so much as these gymnastics to overcome effeminacy and sluggishness of habit; so that their *athletæ* were good in themselves for forming strong and enduring soldiers. The description given by Aristotle is much to the purpose. He describes the *wrestling* to be made up of courage and vigour of body, strength and sagacity, for the movements are quick and strong; and in the same way he who is able to project his legs, and to move them longer and more rapidly is a *runner*; he who can compress and hold them together is a *wrestler*; he who strikes hard a "gladiator," and the mixture of both these a *boxer*. The latter it seems both wrestled and sparred, using devices also not allowed in the "ring" of the present day. But all these are taken from the *quinquertium*, or five principal Olympic Games, which consisted in hurling the quoit, running, leaping, throwing the dart, and wrestling. There is then obviously some art required in this thing, for whilst nature consents that strength and speed should be joined together the principles which govern the development of the body are also to be established. Among the common *athletæ*, strength and bulk seem to have been the wrong principles. Thus, they could not contend as did those who were trained in a superior manner,

where even those who were naturally slow in action were rendered agile by practice. Those who conquered in all these five games were rewarded with the honour of a public statue. These are the men who conquered at the Pythian, Isthmian, Nemean, and Olympic games. At certain times of the year the Grecian priests also were wont to exercise.

The *monomachoi* or *gladiators* were taken from among these *athletæ*, and we are told that some were for lighter, others for heavier contests, and these latter were the gladiators. Respecting the latter, it was laid down in the laws of Ulpianus that if any one in the wrestling or boxing, or whilst the boxers exercised among themselves, killed another, no notice should be taken of it, because such were done for glory and honour, and not as a crime, and there was consequently no *damnum datum* in the affair. Therefore, we may judge somewhat of the estimation in which they were held in the time of Alexander Severus, for there was a strong national feeling which attracted the people to these spectacles. The *athletæ* on entering the arena were greeted by every one rising; in the Senate also they were allowed to sit next the senators; whilst, when victorious, they were freed from taxation, and returned to their native countries in triumph. This calls to mind the recent spirit of our people in the international contest, as it was called, between Tom Sayers and Heenan, where the former received quite an ovation in certain parts of the Metropolis after the fight. In the more recent contest between Heenan and King, it would seem that the Englishman is almost the only man in the world who can stand unmitigated bruising.

Galen, therefore, was right enough when he inveighed against these practices, and the mischief that had arisen to mankind from them. All that was sound in mind and body became corrupted; a most useful art was merged in the vulgar

practices of the amphitheatres, which were, indeed, the means of its suspension. We may readily imagine how strong the reaction, inaugurated by Galen, became, when Servius and Lactius stigmatise Plato as an athlete, thus lowering himself as a philosopher. That great philosopher, however, was a living witness of what the gymnasium could really do both for body and mind. Again, it was surprising how small were the advantages reaped from these thousand exposures to slaughter. We have first the *gift*, next the *applause*, the third, *post-humous or recorded fame*, and, last, the *crown*. According to some the *gift* was more sought after by the common body of persons; for we think it was nothing more than the eongiarium or gift of corn or money, though, as far as posterity was concerned, it was accounted a mean affair. The same might be said of the *applause*, which, in the Greek expression, means *inciting to action*; though, according to some, there was a better impetus given through a custom granted the athletæ of collecting small rewards from each spectator.

Something may be learned from the manner of living of the athletæ. Of the actual depravity of most of these men we have the eloquent and most impressive testimony of Hippocrates, Plato, and Galen; and in no way or degree were they worthy our imitation any more than are our modern members of the "ring." So far as we know, their method of living or training was comprised in six rules, which were considered by physicians at that time as quite empirical, viz., all that regarded their *food and drink*, their *sleeping and wakefulness*, *rest and motion*, *air*, *affections of the mind*, and *evacuations*; whilst something appeared to have been done almost every hour in respect of these rules. Their diet was regulated in a quadruple sense,—as to quality, quantity, order, and time. In what relates to quality, we find the athletæ partook of various

kinds of food at different intervals of time. Among these we find them eating sheer-grass, which we believe was done that they might grow more stout and vigorous. Authors disagree as to the period when they were first allowed to use flesh. Pliny states that the pupils under Pythagoras, when exercising, first ate flesh, and the use of figs was an equally antique article in the dietary of the ancients. Before long, they were fed upon flesh, and that chiefly *pork*. Yet the flesh of goats was often eaten by them, and some have ascribed superior strength to those who fed upon the latter meat. Of swine, the flesh of wild boars seems to have been the most prized. Galen allows that they ate both beef and pork, adding to it unfermented bread and cheese, which was called *coliphium* or *dry diet*; whilst they were evidently not only well nourished by these hard and gross aliments in a greater degree, but they remained satisfied by them a long while. Some produced disease by their immoderate use. They seemed to have constantly taken *anethum* or *dill* with their food, probably believing that it produced more solid nutriment; and in the same way they seasoned other food with sweet herbs, and thus relished them the more, or induced sleep by the better digesting of hard food; for the physicians considered that dill induced sleep.

The quantity of food consumed by the *athletæ* was certainly greater in proportion than that of other men, as we learn that two pounds of flesh formed one of their smallest meals. Still this may be only excelled by other fabulous accounts, such as those of Milo, the celebrated athlete of Crotona, and the boxer Hericlides, one of whom swallowed twenty pounds of flesh and the same quantity of bread, and, when "*dry*," three drink-offerings of wine, retaining his breath the while, and the other was equally notorious for his capacity for food and drink, so that there was none equal to them. Aristotle, while he

believed that the athletic games carried off these excesses, very properly stigmatises the practice as *forced gluttony*; and Galen's view is equally correct, that, though there was a necessity for this increase of food, yet it was more than their systems could bear, and, indeed, they were compelled to eat it. The reader may well look upon the foregoing as one of the most important points to be considered in the question of the effects and value of *constant* powerful muscular exercises. Some take the dry feeding to have been chiefly figs and nuts, with nothing boiled or moist; no cakes, nor cold drinks. In like manner it is abundantly clear that they exhibited no order in feeding the *athletæ*, and no particular time, unless it were the custom, to which Galen refers, of taking hot food both morning and evening; though it was taken at table, and possibly with sleep after it. Some thought that the *athletæ* were always more desirous to digest their food by walking than by sleep, considering sleep rather conferred corpulency than strength, and that great variety of food was bad. They, however, wisely portioned out their periods of sleep and activity, though some stigmatised them as sleepy. The system of feeding the *athletæ* here adverted to, was, doubtless, unworthy of the name, and peculiar only to that form of degradation which marked the tastes of the people during the decline of Roman greatness. This view will be more clearly explained in what follows.

In Sir J. Sinelair's 'Code of Health,' Jackson, the trainer, seems to approve of dry food, for he states his belief that drinking encouraged soft, unhealthy flesh. He considered *meat* to be absolutely necessary in training, in order to gain muscular strength. The thing was, first to reduce grossness of habit. On the days of fighting little was taken but mulled wine and biscuits. Early rising and very moderate diet were enforced before commencing the exercise and training of the

day. A man's powers of endurance in the battle were considered to reside in his powers of "wind," and it is not likely that such a state could exist together with grossness of body. Besides which, modern research into the physiology of man has shown that fat in any excess is a form of *degeneration*,—the body, in its decline, being influenced by one of two kinds of degeneration, namely, atrophy or shrivelling up, or gradual extinction of muscular and tissue power by depositions of fat in place of healthy fibre and fibrous tissue. Long-lived people are, therefore, nearly always thin,—atrophy being obviously slower in its *declining* force than *fatty degeneration*. Let no old persons, then, feel aggrieved at beholding themselves gradually shrivelling up!

These conditions show the necessity for a balancing of diet as regards the farinaceous and the animal foods. The savage, who at times lives almost exclusively on animal diet, is very thin; but there are seasons when he changes this entirely, or he could not exist. Were he fed exclusively on farinaceous food, and allowed much liquid, especially fermented liquid, he would speedily become lazy and unwieldy. The *athletæ* of degenerate Rome were great gluttons and drunkards, and were in every sense a short-lived race of men. Power for great endurance of physical fatigue is given by animal food. Leichhardt and his companions, in their first great journey into the interior of the Australian continent, were rendered exceedingly thin and wiry by living constantly on horseflesh. Still they suffered slightly from scurvy, which, in men pent up on ship-board, and living on animal food, usually rages with a virulence unknown where exercise upon land is taken freely. Exercise on board-ship is much like the exercise which people running upstairs half the day consider, erroneously, of course, to be such a grand equivalent of walking!

Sanctorius has rather quaintly affirmed that, "ponderosity is a kind of strength";—that an old animal should, in fact, be heavy to last long. He remarks also (and we really think that there is a good deal of truth in it) that, "a person destroys himself by degrees who eats, however little, once a day *besides* his ordinary meals;" and that (which is certainly true) "a person who eats more than is requisite, is nourished less than is requisite." All writers condemn eating immediately after much bodily or mental exercise. Sanctorius considered this to be one of the causes why apparently sober and moderate persons astonish their friends by dying, their death being the result of taking food injudiciously at those times, because the weary body perspires or exhales with so much difficulty after excessive exertion. Whatever may be the worth of this explanation, it is usually found that the serious results of mental or bodily exhaustion have some connection with what is taken into the stomach immediately after either;—instead of repose, the bath, and friction, being used as restoratives previous to partaking of at least a full meal.

Galen declared that the *athletæ* were wont to preserve no proportion between motion and quiet, for whilst they laboured the whole day in exercise, they took part of the night also, sometimes with food, sometimes before taking food; just as if they despised and held in contempt the universal precept of health of Hippocrates,—*labour, food, drink, sleep, all in moderation*. On the contrary, they proposed the opposite rule to his, namely, to perform these things always immoderately, and to labour with no habit of regularity. It was observed, too, that their complexions were improved by moderate sweating, but if it was excessive they grew pale. Therefore, it was very properly asserted that the *athletæ* laboured too much, for it induced pallor, whilst moderate exercise diffused a healthy glow over the

entire frame. Consequently, those persons who labour and eat without any rule whatever, must not be surprised at what Galen affirmed of the athletæ—that *they lasted five years at most*.

In the same manner, we are led to believe that they made no distinction among themselves as to the nature of the atmosphere, exercising under the hot sun, for example ; nor of the winds, nor of any other conditions of pure air. Still, where men were exercised or trained for the public contests, care was taken that it should be done in healthy air, as manifested in the construction of the *xystum*, which was erected in the gymnasium. The latter, Vitruvius described as a place where the athletæ, to avoid the injurious winter air, were wont to exercise with comfort, in a more congenial atmosphere varied to that of many climates. They not only took their instructions from the pædotribes as to proper diet, but they followed out the prescription of exercises appointed by the master of the gymnasium. Thus we read that the ancients sent their athletæ to Ravenna, as they there might exercise in more salubrious air.

That the athletæ were prone to the more severe kinds of mental affections no one can deny, who considers the great cause for excitement springing from their contests,—how much the conquered were depressed and the victors exalted ; and, in fine, in what state of mind they constantly lived, how such were afflicted, sometimes with fulness, sometimes with emptiness. Sencea mentions that Pyrrhus, a great preceptor of gymnastic contests, was wont to instruct those who exercised that they should not get angry, lest it should destroy their skill. Strict continence and moderation were largely enjoined by many authorities, medical and otherwise. Every means, in short, appears to have been adopted to guard against loss of vigour through these causes, both by cold bathing and strict

watchfulness. And they were further stimulated to avoid injurious habits of mind and body, by being reminded that they engaged in the "Course" for an immortal and not a mortal crown ! They were distinctly ordered to abstain from enticing food and drink, by which they were hurt, troubled, and fatigued. They were more especially attentive that youths should so abstain before the twentieth year, lest their bodies should undergo undue or too early development and excitement. That peculiar hoarseness of voice, resulting from great indulgence in this respect, was well known to the ancients. There can be no doubt then that many of these conditions, and the abuses which arose from them, brought great detriment to the health of the *athletæ*, as Hippocrates silently admits, whilst Galen himself was often a witness of the loss of power, sense of motion, suffocation, and rupture of vessels, among them ; and we have the authority of both that they were not long-lived. It is curious that Celsus should have prescribed for *pleurisy* the use of athletic diet, unless it was of a kind more perfectly adapted for strengthening the afflicted person.

Many of the *athletæ* had, notwithstanding, an appearance of dignity, and, though naked in the contests, they wore round the loins a sort of open truss covered with cloth, and, in some instances, short drawers.

Turning to other kindred subjects, it is worthy of inquiry as to what *exercise* really meant, and in what way it differed from the terms *labour* and *motion*. We have already partially shown the difference between the true and the false in gymnastics. Exercise is emphatically the art of producing a healthy frame by the very operation itself. It certainly had a consistent plan of operation in those early times, though that plan is lost to us. Galen has defined exercise to be strong motion and change of breathing, alternate or varied ; and he also demonstrates that

exercise, *motion*, and *labour* were things which differed from each other. *Motion* is the thing which is more common and more convenient to many than exercise, as most people move about often enough and call it exercise; but exercise it is not unless there be strong motion. In the same way *labour* may be strong motion, but labour in all cases is not properly called exercise, as they say digging and reaping are not properly to be considered exercise, although labour be commonly put under the same appellation. Galen likewise judged it to have been so considered by Hippocrates where the latter says "labour should precede food, and when hungry it is not right to labour:" and in this respect he also condemns both *grief* and *labour*. The two latter doubtless destroy half mankind,—coupled of course with injudicious or excessive supplies of food. The difference is not so much in terms as in the fact that labour is a compulsory thing, and therefore not resorted to by the affluent, to whom a sufficient amount of daily exercise is equally necessary, and with whom it is more honoured in the breach than the observance. To be moved by other forces is certainly not the exercise that came under the definition of Galen, namely, that it is a voluntary motion from which deep and frequent breathing is necessary. When therefore the exercise was to be strong, he very consistently blamed those who enjoined merely gentle walking. Galen viewed the matter in its *medical* aspect. Many persons move about, with strong voluntary action and increased breathing, who on no account may be said to be properly exercised; such as the quick movements of servants following the commands of their masters, and others who, either impelled by fear of enemies or to avoid dangers, move violently, and breathe frequently and deeply. Another author considers exercise to be "a motion of the members, some of which are regulated by the will,"—

which explains nothing. Another definition we may quote as nearest the truth, namely, that exercise, that at least which we esteem as such in a medical point of view, is "a strong voluntary motion of the human body, with alternate free breathing, either done for the preservation of health, or for the sake of acquiring a good habit of body." This brings the case under a simple definition, so that some will be able to determine by it, whether any motion in riding or sailing deserves the name of exercise, which has nothing to do with the *will* of man, but is rather dependent on external agencies. Yet we must not doubt that some people are exercised by such operations; and if not well enough, they may use jumping for the sake of health or for their military studies; though they still may not be considered as properly exercised. Riding on horseback, however, is essentially *active* exercise, though in its mildest form. It is therefore useful to consumptive patients in the incipient stage of that malady. Galen also indicates it where he says that those who dig, and ride on horseback, do it not only by way of labour, but for exercise. Jumping is among the strongest movements or exercises: it is also to be carefully distinguished from gestations, walkings, and vociferations. It was a wise thing, therefore, in the Greeks to settle all these disputes and shades of opinion by having a place set apart for bodily as well as mental education, calling it a gymnasium. People could be well exercised without this building, but the true art of mental and bodily development would have scarcely existed without it. We mean, of course, strictly owing to the early condition of learning and the arts in that era of the world. Plato seemed to think that as the right hand possessed more power than the left, and simply from *use*, so youths might be exercised with their left hands for the purpose of improving them; and in many cases he thought these means

developed powers over musical instruments, whilst in others there was merely the gymnastic effect produced. Above all things it is certain that much may be done to produce agility, beauty, and symmetry of limb. In addition to the latter, that men might become more apt in carrying on war, Plato divided the exercises into dancing and those common to the palæstra. That there was a degree of art in this, Galen admits, where he speaks of easy flexing of the legs; whilst *walking*, riding, and similar exercises were by no means inferior to the dancing and such like of the palæstra. The whole matter rests on the two points as to what some men might do themselves in the way of exercise, and what was necessary to be done by others. This *dancing* must not be confounded with the theatrical performance, of inferior character in every respect; just as the low practices of the palæstra, which we call *athletic*, are not to be mistaken for the more important and scientific series of exercises for development and improvement of the frame.

The different effects and results of exercising the muscles are well worthy of notice; especially with regard to their harmony of action. Sir Charles Bell pointed out the fact, that when he drew out an *extensor* muscle with a weight, contraction took place in its opponent *flexor*. More recently the excellent researches of Mr. Skey, published in the 'Medical Times and Gazette' for July 23, 1853, bear out this point. The whole paper is well worthy of perusal; but it will suffice for our purpose to mention the leading points in it. Several interesting experiments were made by Mr. Skey upon animals, and the result was, that when the extensor muscle of a limb was stimulated to contraction by means of the galvanic current, there was contraction also in its opponent flexor, thus showing the influence of a controlling and regulating power in antagonist muscles. This antagonism, he says, is only found in muscles

of a wide range of power, and where it is required for the purpose of controlling what, without it, would be a dangerous engine of destruction to the organism,—that is, supposing, as Mr. Skey adds, “the larger power of the *biceps* be applied, by the accident of spasm, or other deviation from health, to the lesser purpose—what would be the result? Surely fractured bone or lacerated tendon or muscle; for the bony organisation of the forearm is hardly competent to contend against a force of a quarter of a ton suddenly brought to bear upon it.” The power of certain muscles is remarkable. Take two of the principal muscles of the arm; of these Mr. Skey says,—“we may infer, therefore, that the two muscles—the *biceps* and *brachialis anticus*—in supporting a weight of fifty-six pounds in the hand, act with a force of from five to six ewt.; and that their action, when exerted on the unweighted hand, is equal to twenty pounds only. This is a large range of action, and demands, on all occasions in which these muscles are called into play, an exact adaptation of the requisite force, neither more nor less. But muscles, under disease, are liable to false applications of their power. These actions may become sudden, uncontrolled, and violent, as in the case of the fractured patella, or the ruptured tendo-Achillis.” It must not be understood from this that every muscle or group of muscles in the body has its antagonist; for this is not only not the case, but it will be seen, from the same able authority, that even the muscles which are antagonised have sometimes an isolated action. Speaking of that great mass of muscle, the *quadriceps* of the thigh, and its obviously possessing a function far higher than that of “extending the leg,” and “elevating the thigh to the vertical position,” he says, “we, therefore, look to the so-called secondary function, in order to explain it. That consists in raising the entire trunk at the remote end of a lever of

some fifteen inches in length, for which the contractile power required is enormous. In the first of these actions it has antagonism; in the second, none. If this large muscle be employed for the purpose of straightening the leg, it is controlled and regulated by the *semi-tendinosus*, *semi-membranosus*, and *biceps*; while, as an elevator of the trunk from the sitting posture, *these three large muscles co-operate with it* by drawing the pelvis, and trunk also, upright."

"We have another example in the semitendinosus, semi-membranosus, and biceps: they possess a power of contraction, even when employed as levers of the third class, largely beyond the mere act of bending the knee; and in this action, therefore, they require antagonism, which we find in the quadriceps. But, reverse their action, and they become levers of the first class, and their duty is enormous. On them devolves the function of elevating the body from the stooping posture—in which duty they have no antagonist. It is also important to recollect that, in the first action, as flexors of the leg, they act singly, and on one extremity only; whereas, in the second action, we have the double group of both extremities engaged. If these views be correct, we may infer that volition extends to any given muscle merely a preponderance of action over others,—the muscular system, and more especially of the extremities, is invariably the subject of compound actions, by which several are brought into play for each movement. The harmony of the muscles of a limb consists in their entire co-operation with the actions of each other, conducing to a general effect, and for which many muscles are required. When we assign any given function to a muscle we may be so far correct that it is the chief agent by which a certain movement is accomplished; but the movements of individual muscles are concomitant with

the movements, probably, of many others, by which their actions are controlled and regulated. In this complication, in this infinite variety, consists the true 'harmony of action' of the muscular system."

It is this "harmony of action" of the muscular system, now so thoroughly recognised by anatomists, which gives to exercises, specific or otherwise, so much of their power, and which maintains in every sense the perfect *balance* of the human frame.

CHAPTER V.

Exercises out of the Gymnasium—Dancing—Varieties of games at ball—Wrestling, Boxing, and the “Gloves”—Description of an Amphitheatre; the abominations practised there—The Skiamachia.

WE have traced already, with as much clearness as we have been able, the many probable methods and sorts of exercise had in use among the ancients; yet there are others of equal and, we think, of more real importance to the bulk of mankind, which were and are done abroad—out of the gymnasium, in fact. They are exercises, yet not, properly speaking, gymnasties. Our object is to treat of them as subject to the rule and guidance of medical knowledge. The ancients were wise in training the body both in its physical and intellectual qualities simultaneously, keeping a just balance, and permitting neither to receive undue attention, as we perceive to have been the case with the simple corporeal or animal development of the *athletæ*. Thus it was that Galen rightly condemned the latter, and subsequent times have not removed the ban. The first thing we have to consider is the *dancing* of the ancients.

From the works of Homer may be gathered three kinds of what was then called the *orchesis*, or dancing. The first is the *cubistica*, which is described as an art by which men danced in various modes with contortions of the feet, hands, and head, the same as performed in our time by mountebanks

and other persons for the sake of money, and who went abroad through different cities acting plays. The latter was, however, a misnomer, it being more properly what was called the *Kubistema* or *tumbling*. The second kind was called the *sphæristica* or game at ball, because they jumped in these games at ball. Athenæus authoritatively speaks of the third kind as the *orehesis*, which simply means *dancing*. The latter was entirely used for pleasure, a custom which remains in our own and will in all subsequent times, for it is a powerful inducement to exercise implanted in our nature, and is shared equally by the civilised and the savage. This dancing with them was not altogether without use among the warlike exercises, for Plato divided it into three parts,—the *military*, *that which suited times of peace*, and the *general*, partaking neither of the former nor the latter. He called those military which imitated the high leaping, the sudden depression and inclination towards the enemy and avoiding their attacks, expressing by various figures the actions of *darting* and *striking*. And this was so frequently practised that he wished to have masters in his Republic who, paid by the public, should teach these both to men and women. That they were deemed of great service in producing military skill in the soldier is affirmed in records of the Lacedæmonians, who made them subservient to training for war. Among the secular games performed before the Emperors *dancing* occupied a conspicuous place. There was one called *amphisbetesimon*, which was used at the sacrifices and expiations. Galen recognises its value by stating that many weakly persons were restored to health by wrestling, dancing, and other exercises of the kind. With individuals at that time it took a middle position between the public dance and private contest, and by many was declared to strengthen in

a remarkable manner the weak bodies of boys, women, and old men. But with that form of dancing which Plato described as *suited to peace*, and, as he writes, that would be adapted to the consistent and moderate enjoyment of temperate minds, modern times are fully acquainted.

The *orchestica*, or third division of *dancing*, was one easily recognised even at the present day, imitating as it did customs, passions, and actions by a variety of gesticulations. From which it would appear that what we have already called the *orchesion* was no other than such a faculty of motions and gestures of the body, done with perfect art, as imitated the manners, affections, and actions of men. For Aristotle, while admitting the dancers were used to *numbers* in imitating actions, states that there could be nothing that more perfectly expressed the similitude of things than numbers and singing. Plutarch gives three expressions to dancing, as *bearing*, *figure*, and *aspect*, the whole of it consisting in motions, habits of body, and conditions of rest, like the harmony arising from tones and intervals. He said that *bearing* was none other than motion affected by some one as representative either of action or power, but exhibiting the figure, habit, and disposition in which motion or bearing should be defined. For when the dancers stood in the quiescent state they, according to Plato, so disposed their bodies as to resemble graphically such figures as those of Apollo, Pan, or Bacchus. Yet in exhibitions of this kind, the latter were not alone represented, but other things also; just as the poets, when they *imitate*, use in some cases feigned names, in others altered names, and, when they *indicate*, use proper names. In the same way dancers imitate, by figures and gestures, the whole art, consisting of bodily movements and gesticulations, both in number and order; or manners and thoughts were imitated by bearing, deportment,

and figures which indicated the customs, perturbations, and actions of men. All these being at times represented together, dancing was by one of their poets, Simonides, called *silent poetry*, or poetry speaking in dancing, though Plutarch contends that the dancing in his time was corrupted by the music with which it was associated. It was looked upon as a gift emanating from the gods, and being of such divine descent there was no wonder it held sway over the tumultuous and ignorant spectator, though, as in our own times, it is very much corrupted in practice. But it is not equally apparent who first taught men this kind of dancing. It was supposed to have originated in one Audsona, who is described as sounding his Sicilian pipe, and making figures and motions with his body; on which account dancing was called often *sikelezein*, that is, to do after the manner of Sicily. Among the ancient Sicilians it was called *ballismos*, a dance, whence even to this day the name *balli* exists among many nations of Italy. Dancing indeed was of such estimation and honour that it was made an attribute of Apollo.

“Saltator rex splendoris, pharetratus Apollo.”

And it was usually accompanied by the pipe, lyre, or other instrument, with or without singing. Many ancient authors mention divers species of dancing, many of the most exquisite or renowned deriving their names from countries wherein they were practised, or had been witnessed, or from the inventor, or the method by which they were produced. Such as the *Pyrrhic* dance, for example, was invented by Pyrrhus, the son of Achilles, in which they danced fully armed, with or without singing. These dances were very singular, and obtained a variety of names, as *Orsitis* and *Epichedios* with the Cretans, *Carpæa* among the Æneians and Magnesians; some were called *apochinos* or *mactrismos*, in which women danced, and on account

of it they were called *Martypicæ*; whilst the more durable of them were marked by greater variety, as *dactyli*, *iambici*, *molossica*, *emmelia*, *chordax*, *sicinnis*, *Persita*, *Phrygia*, *nicatismus*, *Thracius*, *Calabrimus*, *Telesias* from Telesius who first danced fully armed. The latter was used by the soldiers in the Ptolemæum, which was a place in Athens dedicated to exercise and study, and chiefly by those of the armies of Philip and Alexander. Others were called *tornatiles* or *versoriae*, because the dancers danced turning themselves round in a circle. These dances were also called *dinous* (twirling round); others were of a mad kind, as the *caudifer*, *mougas*, *Thermaustris*; also the *flowery*, because the dancers covered themselves with flowers; others were of a droll or comical sort, as the *igdis*, *mactrismus*, *apochinos*, and *sobas*, *morphasmus*, *glauz*, and *leo*; others were theatrical, such as the *tragica*, *comica*, and *satyrica*; and others were of a lyrical kind, such as *pyrrhichia*, *gymnopædia*, and *hyperchæmatica*. But it would scarcely be necessary, even were the matter easier than it is, to specify the manner in which all these were performed. It is sufficient to mention the number and variety of this third species of dancing, to show the extent of their perfection in the art. Indeed the whole matter of dancing as an exercise to the entire frame is well disposed of by Aristotle, where he says that all the motions are composed of impulse and drawing-out, as the body may either be impelled in dancing or brought forward—then upward or downward, straightforward or backward, on the right hand or on the left; from which movements are afterwards very properly composed simple walking, bending, advancing, jumping, striding, halting, kneeling, lifting-up, throwing out the foot, and change of posture.

The constant exercise of the feet in games and hunting, doubtless, led the ancients, even before dancing was invented,

to make use of gesticulations for the purpose of exercising the hands in a variety of movements. This afterwards led to dancing being made up of carefully regulated movements of the hands and feet, representing, as before shown, things or ideas. Ovid thus alludes to the movements of the arms:—

“ Si vox est, canta ; si mollia brachia, salta : ”

and,

“ Brachia saltantis, vocem mirare canentis.”

Although the primary intention may have been imitation, nevertheless we discover that they had other ends in view, for dances were not only used in the theatre and games for the sake of affording delight, but at the sacrifices on religious grounds, as Galen testifies. Indeed the latter vehemently inveighs against the men of his time for giving too much attention to dancing, and thus, solely given up to voluptuousness and play, they neglected more valuable accomplishments.

All the *armed* dances, training even women for warlike purposes, were called *pyrrhichia*, in which boys, men, and women learned how to retreat from, to attack an enemy, and other arts of war. We are told of Mima, a girl, dancing the *pyrrhichia* before the admiring Greeks. In this sort of dancing, therefore, were the germs of an excellent custom, and one not a little conducing to the preservation of health, seeing that the gesticulations with the hands, which the Greeks called *cheironomia*, are found in the writings of Hippocrates, Aretæus, and others, as adapted for exercise to healthy and sometimes to sick bodies. No one will dispute, even in our times, the value of dancing, whilst Galen himself confesses that he not only restored many to health, but preserved the health of many more by dancing alone. He considers that dancing, among other things, is necessary in a medical point of view, where he alludes to the vehement motion of the dancers in the manner they commonly

dance, the rapidity with which they twirl and twist around, bending the knees and rising again, and repeatedly striding and drawing the legs together. The *tumblers* were the most vigorous performers in the *orchestica*. Even poets did not scruple to dance, whilst boys and women were, more frequently than all others, exercised in dancing.

According to these rules, some persons, for the sake of their health, pursued most vigorously the work of dancing, either by the orders of the physician, or under the direction of the gymnast. As to the places where dances were performed, they were, firstly (the people not being yet sufficiently polished), common to the public streets; thence they received greater dignity and ornament, some being transferred to parts of the theatre called *orchestræ*, whence came the term *chorea*, a name for dancing. From the theatre they were brought to the *palæstra* or gymnasium, according to Athenæus, for there the *pyrrhichia* was danced in an extraordinary manner by boys, who were seen to excel in gesticulating. This author makes the *pædotribe* Meniscus a judge of dancing, and thence comes our authority for conjecturing that the *pædotribes* were the ministers of the gymnasia, having no small knowledge at the same time of the *orchestica*. Dancing was nearly always used in convivial assemblies, though we may conclude it was fairly embodied in the laws of gymnastics.

In whatever way we may view the dancing of the ancients, as to its order, time, plan, and harmonious proportion, it is clear that it did not require the aid of music; and yet our dances, and the movements and gesticulations which, in our day, women, rather than men, exercise for our amusement and delight, may be considered not altogether dissimilar to them. Still one can perceive a difference between our dances and those of the ancients, because in their case they served for

health, whilst in ours they are rarely or never performed to that end, for they are often performed after supper and at night, taking the place of quiet and sleep. Whence it appears that if we danced after the ancient model, much advantage would be gained from it, and this will explain why the physician of those times recommended it to some of his patients.

Among the more robust sorts, the tumbling was used for the purpose of strengthening the arms and the legs to the same degree, and all who could master it experienced these effects. Persons who desired to produce robust arms and a flexible body, frequently used this exercise. Yet, as in this exercise, the head was turned to the earth, the viscera altered in position, and the articulations of the back strongly affected during the flexions, it was to be avoided by those who had any weakness of the head, infirmity of the viscera, weak back, and articulations, either naturally or accidentally induced.

The *orchestica* related to gestures, of which, among the ancients, there were many varieties, almost abolished or little used in our day. They agreed with the *cheironomia* or mimetic movements of the hands for the exercising of the superior extremities and parts adjacent. Hippocrates seems to have used a similar movement in inveterate pain of the head, when by degrees it removed it; and Aretæus also commended it in vertigo, epilepsy, and colic. This form of dancing, heating the whole body by diffusing its circulation, drove away rigors, and was especially adapted to some kinds of convulsions. More especially useful was it as a remedy, where the stomach laboured from indigestion, or from an aggregation of crude particles in the body. Besides, it has rendered great service in cases of tottering hips, infirm legs, malformed feet, many standing in need of its aid even in that age. Nor did it yield the palm to other exercises of the sort,

which were used for the purpose of removing small calculi from the kidneys or bladder. But it may be very hurtful in pregnancy, especially if continued long at a time and frequently ; as Hippocrates testifies in the case of a singing-woman, who, to avoid scandal, sought to produce a miscarriage by dancing, a thing that subsequently happened. Whoever has a weak head, or is obnoxious to vertiginous affections, is undoubtedly injured by the circular dancing, the turning, and continuous motions. Those were injured in a like degree who suffered from weakness of the eyes or vision. Those who have weak or inflamed kidneys, or who suffer from well-known constitutional weaknesses, should abstain from dancing ; other affections of like nature, when excited by the heat of these movements, often broke out again. There were, therefore, many degrees of dancing, which more or less agitated the frame, especially such as were gone through under the weight of armour, or with weapons of warfare.

Systematic exercises have also been recommended, and proved to be highly serviceable to *epileptics*, by many physicians of modern times, who have combined them with other treatment. Bacon recommended, in these cases, bending the body forward, rubbing the legs and face, stopping the mouth and nostrils hard. We recollect a case, where the friends of an epileptic youth, whose fits were marked by little convulsive movement, but accompanied by total unconsciousness, were in the habit of rubbing the region of the stomach during the attacks, and stated that by so doing the attacks seemed to be milder and shorter. Cases have also occurred, where patients have been cured or relieved by a diet of milk and bread exclusively, or by milk alone, where the milk and bread occasioned flatulency. In one case, the fits were warded off for many years by the milk diet alone. Dr. Bland Radcliffe's opinion

seems to us nearer the truth than the majority of such with regard to this terrible malady, for, finding the fits are suspended for a time during the operation of any active inflammation or fever, he rightly concludes that it is not connected either with plethora or fever, but "with a state of the circulation which verges very closely on syncope and asphyxia." But it must ever be borne in mind that there is a condition of brain peculiar to epileptics, for it is well known that nothing has suspended fits so completely for a time as the *hope* engendered in the mind of the patient by merely changing his physician, especially if the latter were either Dr. Hopeful or Dr. Confident. This peculiar condition of brain, therefore, renders such individuals liable to attacks from any of the known causes of convulsion. The brain is brooding over its malady in some cases, and the entire digestive functions are depressed; the secretions vitiated, and constipation very prevalent and obstinate. It would appear then, that systematic and careful methods of exercising the body, improving its circulation, and thereby giving the brain and other important organs a better supply of as well as a healthier blood, would have at least as fair a chance of success as other methods which promise alleviation in such usually intractable cases, or in such an ancient and still mysterious malady. The anterior or motor nerves of the spinal cord and the sympathetic nervous system appear to be involved in the epileptic paroxysm. And here theory may linger long with reference either to the proximate or final causes of the latter. But to continue.

Next in order to dancing, among the exercises of the ancients, came the *playing at ball*; indeed, some divided dancing into tumbling, playing at ball, and the common dances of the theatres. The ball-playing, however, is chiefly deserving of notice. This is one of the oldest games or exercises in the

history of the world, and was brought to great variety and perfection by the ancients, who set apart a place for it in the gymnasium, called the *sphairistikon*. Its origin is much disputed. Among the Greeks about four kinds have been traced, namely the *little ball*, the *great ball*, the *hollow ball*, and the *inflated ball*,—the latter, doubtless, being identical with the *foot-ball* of the present day. Some have contended that the *inflated ball* was but an instrument resembling a ball, but not one actually. The games with these were of three different sorts; the first was the *little ball*, with which they exercised chiefly to elevate the bodily powers, and a number of persons together threw it from hand to hand. The *second* was a ball somewhat bigger, in playing at which they stood a foot and a half apart, not standing still, but moving in various directions, and turning to that side and this according to the direction of the ball. The *third* was that of the ball next in size to this, with which men played at a distance from each other, in which part were stationary and part moving, throwing the ball with force and adroitness. The *inflated*, or *foot-ball* of our times, is one of the most justly esteemed games of the kind we have, and from none can a larger amount of healthful exercise and excitement be obtained. It is now played as it was several thousand years ago, though the ball itself may have differed then from its present structure. The game appears to have been called *episcyrum*, and is described as a game at ball “where a company was equally divided into two sets, a line drawn between which they called *scyrum*, and in which each strove to get the ball home,” and thus obtain the victory. Some of the players led the ball away, others cast it, others went after it and again expelled it, with a great deal of shouting and noise, both among themselves and those who happened to be looking on at the game. It required very dexterous movements; and

Athenæus describes at length the great enjoyment, as well as skill, shown by the players in it. There were other inferior games with the small ball, one of which was played by tossing the ball in the air and catching it before it fell to the ground.

There were two modes of playing with the great ball, not only on account of its magnitude, but from the different methods of handling it. The most important of these was the one in which they held it in their hands high above the head, walking on tiptoe, and then with a jump projecting the ball violently from them. The *corycus*, a form of ball of this kind, was suspended from the top of the gymnasium, and used chiefly by weakly persons. For the latter it was filled with grain or meal, but otherwise with sand. It was suspended as we have said, and so distant from the ground that it should about reach the abdomen of any person who exercised with it. Thus the person exercising with it, holding it now in both hands, at first moves it gently, then strongly, following it up as it receded from him, and then receiving its returning impulse. In the latter case, after casting it away from him, it rebounds or returns more strongly against his body; but the latter is often prevented by his getting away, for if he do not turn nimbly from the encounter it comes back, and must be met either by the hands, or by the breast with outstretched hands. The object of the entire shape and make of the ball was, that if it struck the hands or the breast it should do so without wounding. This may have been the old *corycomachion*, as well as the explanation of the saying "to be exercised with the ball." Arctæus recommended exercise with the throwing-ball for *leprosy*, meaning, doubtless, this particular form of exercise, and borne out also by other remarks on the *peræ*, bags; or the *sacculi jacti*, little throwing sacks. It was also used by some to diminish superfluity of flesh. For the latter purpose he

also recommends it, joined to the other remedies named by Hippocrates. The place set apart for this exercise was the *coryceum*. There were, consequently, four kinds of ball used in the Grecian games—the *pila parva*, *pila magna*, *pila inani*, and *corycus*; all of which differed from each other, not only in anciently recorded descriptions of them, but in the words of Galen, where he reckons them separately among the exercises of the gymnasium. They were, especially with youths, deemed most excellent exercises for health, as it was seen that among the instruments of health sculptured on the statue of the physician Herophilus, was a ball. These games are, in a medical sense, exercises. The ancient Greeks and Latins also called many of these *paidias*—relaxations of the mind, or what in Greece was called by the boys *paidēs*; which were so frequently done that those who thus exercised themselves appeared not to act seriously, but in joke, though for the sake of health. These differ from all that was done by the *athletæ*, properly called *athletic*, because the same persons had a purpose in it, namely, to divert the people on festive and other occasions.

In the time of the Latins, the games at ball differed in some respects from the more ancient models, though not much in their effects. The principal balls then used were named the *follis*, *trigonalis*, *paganica*, and *harpastum*. The *follis* was a great ball of leather, blown out with air, like in a measure our foot-ball, though, when it was of the larger kind, it was impelled by the arms; when of the smaller kind it was used chiefly by boys, as we read of boys being seen before the gates of the Roman Forum playing at ball. It appeared also on some of their coins. There was another sort of ball, called the *folliculum*, which they threw at each other in combat. The larger sort of this ball differed from the Greek *corycus*, because the latter was suspended, as we have shown, from the gym-

nasium, and was filled with a heavier substance than air. Celsus approves of these games where he says that the evacuations are promoted, as well as the superior parts exercised, by the game at ball. In this sort of game the inferior extremities remained firm, even while the superior were kept in a state of constant agitation. The players often played in a sort of triangular figure, so that by turns, with either hand, they threw the ball from one to the other; and not to let it fall was doubtless considered an exhibition of the greatest skill in playing. That it was a very important and valuable exercise is evidenced by the fact of its very great popularity, and that it was usually played before going into the warm bath. That it was largely used in the country also, we find from the satirical allusion of one writer to the spectacle of old bald-headed men, clothed in red tunics, playing at ball among long-haired boys. Thus paterfamilias, wearing sandals, exercised to and fro with the ball, repeating his endeavours more strenuously lest it should touch the ground, until he was completely exhausted with playing. Next we have the *paganica pila*, or ball of the peasantry, so called, because it was in a manner common to the farm-houses and villages, called *pagi*; or it was most in use in country towns. This was owing to the circumstance that Rome was formerly divided into four tribes or wards, hence the villages and their inhabitants were called country-folk. Whether it originated with the villagers or not is of little matter. It seems to have been a ball of skin filled full of feathers, with its three-cornered sides rendering it much broader than others, though not necessarily more loose, but rather harder; whilst the *follis*, filled with wind, was more or less difficult to play with, according to the looseness or fulness of its inflation. Yet the country ball was harder to play with. In playing with the *harpastum*, the players caught

it one from the other; it was a round ball, and very favourably spoken of by Athenæus. It was approved by C. Aurelianus in the exercises of epileptic boys.

Of the *cricilasia*, *trochus*, *petaurus*, and *pilamalleus*, we have little authentic information, and that little is confused and unsatisfactory. The first expresses the *trundling of a hoop*, yet its figure is much disputed. It is described as having a diameter less than a man's height, so that it may reach as far as the breast, and should be impelled not longitudinally but transversely, the striking rod being of iron with a wooden handle. Small rings were inserted in its circumference in order to give pleasant sounds. From this game it is said Cicero took his metaphor, when in one of the letters to Atticus, he writes, "pleasantly, believe me, and with less *sound* than I had looked for, has this *circle* of political changes come about." The *petaurus* was doubtless, like our modern swing, and afforded that sort of exercise which was called by the ancients *oscellæ*. Avicenna perhaps alludes to this, where he strongly approves of placing a sick man, with the view of making him cease perspiring, into one of these swings, used by boys and girls. It had evidently not only a Greek as well as Roman origin, but was used by the Egyptians and other nations. Whether this was like the tossing in a blanket described by Martial is doubtful—at least for any purpose of health. Many persons enjoyed the latter as a great luxury. The nearest resemblance to the *cricilasia* was the *troque*. It is mentioned as being caught by persons while dancing, yet some thought it was a sort of whipping-top. If, however, the rings upon it were placed there to warn people in the public thoroughfares against coming into contact with it, it could not be the top, which was simply whipped round with thongs. About two hundred years ago, originated the *ball* and *mallet*

exereise of the Italians and others, yet which we need not describe as it resembles so perfectly our present *Crôquet*.

To speak of the uses of the *ericiasia* and the rest of these instruments of exereise is still more difficult. The first of these, so far as we can judge, has no existenee now among the people of any nation. Nevertheless, with the aneients, it held its plaee among great exereises; and was intended to impart elasticieity to the various portions of the frame, owing to the variety of positions into which it was rapidly thrown; whilst it is said weak nerves were strengthened, an intelligent exeitement generated, bilious eonditions dissipated, and a general glow of heart diffused over the body, exeiting healthy action of the skin and its exeretory functions. The *troque* was more among slaek exereises, suitable rather for old than young persons, and, affecting gently the arms and legs, was more servieeable to those who were not able to join in the greater exereises. It was also more suitable to the summer season. Weakly persons, exereising slowly the arms and legs by means of this, often aequired considerable strength. By daily use it was found to excite an action of the bowels, as well as being favourable to digestion. But those who were prone to vertigo or were gouty, or suffering from ehronic uleers of the legs, were reecomended to abstain from this exereise; because in some heads and bodies the above eonditions were both brought forward and increased. Thence it was that Aretæus warns us against such an instrument, ealled then *bembik* (troehus), produeing fits in epileptic subjects. There was another sort of motion produced in the body by the game in which they impelled wooden balls through iron eircles fixed in the ground, or such as approximated a wooden eube. This exereise, by the continual forward inelination of the head, was said to be hurtful to it, and to the loins and kidneys, espeecially in ehronic

affections of the latter. Galen said also, that exercises with the head inclined forward, or performed with the back, by no means suit such persons as rise up from them with an occasional vertigo, or with an epileptic seizure, or ophthalmia,—though he means here incipient amaurosis, with pains in the ears, in the throat, or otherwise ; and who suffer from inflammation in the head and neck. This exercise by writers generally is understood to be the *pilamalleus* or *ball-hammer* game. It is easy, therefore, to conjecture the probable results which ensue from the stronger and weaker exercises. Galen judged it to be a fault of great exercises that they *filled the head*, or produced congestion.

No person of moderate intelligence can fail to distinguish the points in these exercises which are to be noticed in order to avoid damage to health while affording it support ; yet such as enjoy health might exercise with the *pilamallei*. In all cases it is necessary to consider the time, place, mode, quantity, and other requirements of the body ; and if we neglect this, it is not to be wondered at that evil should arise in place of good : just as we very often observe a planned exercise performed by many persons almost immediately after dining, no healthy place nor fit time being chosen, and from this negligence in exercising depraved habits and pernicious affections are induced. So that we may well take the examples of the ancients in the exercising of their bodies, and avoid those errors which most assuredly help to destroy our own. It was a noble remark of Galen that those persons were worthy of greatness and honour who naturally and properly strengthened their bodies by exercising, and, by rightly avoiding carelessness of living, rendered themselves less liable to disease. And with reference to what we have already said of the *pilamalleus*, that one might exercise his back with it, and another should avoid

it because of the weakness of his back, the following point insisted upon by Galen should be understood. It was his wish that in old persons the weak parts should never be exercised, and those parts in other persons only with caution ; because we can never mend the debility of old age, as it proceeds from defect of proper motion, but in other cases it is reparable. Therefore, the weak part of exercise relates to its powerlessness in incurable debility, not to recent and curable conditions of the body, or the excellent and trustworthy opinion of Galen is utterly valueless.

Considering the great antiquity of the games of ball, it is surprising how much correspondence there is between those of ancient and those of modern times ; and yet their effects as exercises were better understood formerly than they are now. We would take them in the order in which they have already appeared in this work. One writer thinks that all these exercises agreed in one point—that they were very strong. Besides they were very common, and those who exercised with one or the other of them were rendered more apt at motion, and the vital powers were strengthened by them. Galen especially employed the exercise of the little ball among the swift and strong, yet without violence ; by virtue of which it attenuated fat bodies, as has been said of similar exercises, so that we find it recorded that the ball was useful in the gymnasium against dryness of body. But the first kind of little ball of the Greeks rendered the flesh solid, and stood in great service for developing the arms, back, and ribs, as they exerted themselves greatly in this exercise. The second kind of exercise of the little ball was formerly in the highest repute, because the body obtained healthy movement conjointly with strength, the sight was improved, and the head suffered from no reflection. The third kind

improved the eyes and the arms, on account of the advantages gained by the inflections of the spine made in running, the latter also strengthening the legs in a wonderful degree. So that we perceive in these species of little ball all those qualities, of which Galen has spoken in his work, to be summed up in these words:—*that they brought forth all the powers of the intellect agreeably with that unity of the bodily powers which is the true standard of health.*

The first kind of great ball strengthened the entire body, though it affected the head and all the superior parts first; and it was used sometimes to produce a diversion of the circulation from the lower parts of the body. In the second kind the great ball was projected and discharged to a great distance with each hand, thus strengthening the arms. But as it required too many hard strokes it is on that account not only useless to the infirm or the convalescent, but even affects the strong with immoderate fatigue. Aretæus judged that the exercise with the great and small balls was hurtful in vertigo, because the circumvolutions and stretchings bring giddiness to the head and eyes. The exercise of the Corycus was placed among the swift sorts, which, as we have said, serve to attenuate gross bodies; and C. Aurelianus used it to diminish flesh, whilst it was called by the Greeks *corymachian*. We opine that in this respect Hippocrates alludes to it also. Aretæus has also lauded it in *elephantiasis*. Still, if we consider the strokes inflicted on the chest by the Corycus we perceive that those who were troubled with weak chests would be endangered by similar exercise, and it may happen that at times vessels would be injured.

We have already shown that the Latin games were made up of four kinds; of which the exercise with the ball filled with air takes the first rank. This game exercises the whole

body. It was a small ball. In epileptics it was thought to do good by exercising the shoulders; and the greatest utility was experienced from both hands being engaged in it, it being asserted that it aided in a wonderful degree the expulsion of calculi from the kidneys and bladder, as well as strengthening weak hips and legs. Augustus, who was disturbed by bodily affections of this kind, for this purpose was fond of the exercise of the little leather wind ball. As it chiefly exercised the superior parts, Celsus states that it profited those who laboured under derangement of stomach and trembling of the body. It was, indeed, a most healthy exercise at all periods of life, being deemed, as it were, to battle with old age, as Martial truly said—

“Folle decet pueros ludere, folle senes.”

The three-cornered game of ball peculiarly agitated and exercised the eyes, which were always following it, now here, now there; now rising, now falling, as it might be necessary to turn them. In dim-sightedness it was to be avoided; as eyes affected much or little with tears and dim-sightedness are more damaged by motion, while rest both recreates and helps them; just as we have said with regard to undigested food, that no exercise should be attempted unless the digestion be first completed. Though hurtful when the digestive process is not completed, yet when extreme flatulent distension and pains prevailed in the stomach and bowels, it was of considerable service in dispersing them and producing warmth and comfort in those parts. C. Aurelianus extolled it on the latter account in the cure of the *colic*; and Celsus mentions it as suited to the stomachs of weakly persons. The country ball and the harpastum were scarcely adapted to any but the strong and healthy; especially the latter, with

which the chief point appeared to be the violent struggles to obtain the ball from each other—thus throwing the body into all sorts of positions, and putting nearly every muscle into vigorous exercise. Weak-chested persons, or those who suffer from disease of the kidneys, should not play at this game.

Under the term *lucta*, which means a scuffle, we have the *wrestling* of the ancients. The Greek term was *pale*, and it was sometimes called *Katabletike*, or *casting down*, as mentioned in the Holy Scriptures of Jacob's wrestling with the angel. The wrestlers ordinarily practised in the porticoes of the gymnasium, being first anointed and then sprinkled with sand. A great deal of dexterity was required and shown in these contests, and a good deal of by-play was to be observed in their movements to throw each other, which was usually by one of the combatants catching the heel of his antagonist; as Plautus alludes to the same by likening it to the effects of wine,—“*Captat pedes primum, luctator dolosus est*”—that wine is a dangerous sort of wrestler, tripping up the heels in fact. But before they went into these contests the muscles were first heated, as it were, which was managed by frictions and gentle motions. Indeed Galen argued most strongly on this subject, fearing injuries and dislocations without these frictions and movements, and laying it down as a custom necessary to be observed in all the gymnastic games, into which persons should not enter impetuously, or before proper training, nor should they attack before they were rubbed, nor be rubbed before they were anointed. The contests were between two persons grappling together. Galen puts it down in almost the lowest position in the gymnastic art, though the ancients contended it was the oldest of all exercises; and this may appear from the nature of the word *palai*—in time

past, the place of exercise called palæstra being primarily known by the term *pale*. Still there were many who desired to deduce the name of palæstra from certain words, such as the connection of *pelos* or the clay powder or wax used in it, as well as certain forms of fighting which seemed full of artifice and cunning. The Greek expressions bear reference to this, such as being "cast down by treachery and cunning;" and also the meaning of Pliny's expression, "from the conjunction and connection of four fingers." The latter referred to the fact that the wrestler operated chiefly with his hands, and from this we can perceive the origin of the word *pale*, a scuffle, or, according to some, meaning to *cast down*, *project*, and to *scatter*. There are other expressions of the same kind, such as the saying, "*appropinquari et vicinos fieri*" (vulgo, "to go in and win"), because it was only the wrestlers who were allowed to fold together, the *runners* were not, nor were the *pugilists* permitted to close. The former are represented on the ancient coins of Syracuse. Tertullian in his writings, after embracing Christianity, declared that the palæstrica was the office of the devil; that the devil throttled men, carrying himself with wily strength, being tenacious for the purpose of occupying, tortuous for binding, and liquid for escaping. Yet the wrestlers did not conquer so much by their movements as by exerting the strength of their hands and arms. Galen mentions that these wrestlings were carefully studied and added by the trainers of the *athletæ*, to prepare them for all the contests; whilst it was an exercise adapted to well-formed men. Both men and boys played at it, and acquired excellent conditions of body from it. Sometimes, as Galen testifies, bones were broken at it. Galen very sincerely disapproved and condemned the excesses which arose from this sort of training, leading as it did to such frightful abuses,

whilst he applauds those means which were necessary to health. Thus it is that the word *palaestra* may apply more consistently to that portion of the gymnasium set apart for these contests. The wrestling was different from the tumbling-wrestling, or wrestling and boxing united, in which they were usually vanquished on the ground. Galen very properly places these among the rapid movements.

The Greeks ascribe great antiquity to the *pugmachia* or boxing, stating that it was in use prior to the Trojan war. Bad and disgusting as this practice became, it seemed rather to have improved upon what the following line from Lucretius would intimate :—

“Arma antiqua manus, ungues dentesque fuerunt.”

In boxing they were stripped, and struck each other with the fist, sometimes covered with brass, or the round sphere called *sphairomachia*, or with leathern thongs surrounded with metal plates (doubtless the original of the modern expression, “a bundle of fives”). Their blows were aimed at the head, now at the back, now at the arms, and now grappling together ; in which he who overcame either felled his adversary to the earth, or with continuous strokes at length disabled him, whilst there were not wanting those who frequently gave battle with the heel. The sign of victory was an admission of the vanquished himself, either done by the hand or some other gesture. The Etrurians were given also to boxing, and used it for the sake of exercise. It is even numbered by Galen among the healthy practices of the gymnasium. Aretæus recommended it in vertigo, unless his meaning be misunderstood. Yet if we regard boxing in its natural light we find it chiefly adapted to promote skill in war, with its necessary strokes and evasions ; though, beyond the use of the gloves, we cannot see

how its violence can promote a healthy habit of body. Some of the *athletæ* attained great renown by the practice of it. It is evident that, as in the present day, the pugilists of those remote times were very careful in training, so as to produce great firmness of flesh, well-knowing they could bear their antagonists' blows so much better in this condition. The boxers may, in a measure, be separated from the rest of the *athletæ*. Then came a third kind of exercising or contesting, known as the *pancratium* or *boxing-wrestling*. This, which Horace rightly called a frantic sort of fighting, need not be particularly described. The physicians could scarcely approve even the mildest forms of this applied as an exercise. It gave great delight, however, to the populace when publicly performed, and men of birth and station scrupled not in those times to be seen engaged in it. We read of the statue erected on this account to Autolicus in the Prytaneum at Athens.

The *cæstus*, or armed glove, used in some of the contests, was a most barbarous instrument, as already shown. Men were liable to be injured so much more by the crushing strokes of the *cæstus* than in open-handed fight. The use of this weapon was alone worthy of the brutalized multitude who delighted in such displays, which had no share in the production of health. Notwithstanding this, if we consider the uses of boxing, wrestling, and the like, there can be no doubt that the body may be strengthened by the *movements* they induce. Such was the training of some of the *athletæ* employed in these contests that marvellous tales are told of their power in breaking stones and wood with their hands, in order to gratify the spectators by an exhibition of strength and healthy action. Thus they came to be considered suitable exercises for strengthening the arms and hands, as well as the fingers. Although

in the movements of boxing the superior parts chiefly received the benefit, yet the lower extremities also partook of them. The breathing being held, the upper parts perspire rather profusely; and we think it is Ætius who mentions the exercising of the upper parts of the frame as being serviceable to persons labouring under *nocturnum seminis profluvium*. Galen approved of the wrestling, when done moderately, as useful in bringing strength to the body, being especially adapted for cold phlegmatic habits, and placed it among the great exercises. Many ancient physicians of eminence believed that dropsies might be cured by a good deal of labour and the continual shakings of exercise. Flatulency was certainly best dispelled by it. The boxing, as an exercise to strengthen the arms, shoulders, and hands, or to render men more agile, was prized highly by Galen, and was a favourite exercise of his own, using, we suppose, a glove similar to that in modern use.

Of the various kinds of contests also we may glean some interesting particulars. Though the word "fight" is used both by Greek and Latin writers under various significations, in our case it was a contest between two persons who fought to gain prowess and skill in real battles, or to obtain celebrity and reward in the public games or spectacles. But before we enter upon this it will be as well to give a description of the ancient amphitheatre, constructed for these exhibitions.

We are taught that under the name of amphitheatres were comprised places which the Romans designed for beholding contests and sports in. One part of the interior of the building was hollow, in which were the *caveæ*, *cages* or *dens*; another was the *arena*, being covered with sand, for at times there was wont to be so copious an effusion of blood as to render it

slippery and dangerous, so that the remedy was sought in the sand, which was renewed at intervals during the contests. Two hundred years ago the amphitheatre of Titus Vespasian at Rome, beautified externally and internally by Domitian, was scarcely a more imposing ruin than it is now. It is described as a rounded oblong, or egg-shaped building, and according to some the graduated seats were capable of accommodating more than eighty thousand spectators. But if we take into account the upper circle and the space afforded by the porticoes, the place was capable of holding many thousands more, either standing or with seats brought with them. The entire building united four orders—the Doric, Ionic, Corinthian, and Composite—so disposed and arranged in all parts that they gradually approached and receded from each other, without the harmony of the whole being in any way deranged. The whole area of the amphitheatre was a clear space, except where was to be seen an altar sacred to Jupiter of the Latins, on which there was an appointed and cruel sacrifice of one of those persons who fought with the wild beasts. It is supposed that under the arena were the subterranean channels, by means of which the water used in the *naumachiae* or sea-fights was secretly and quickly brought in and let out. The Christians were especially among the numbers of those who fought with the beasts, or to use the customary term, “were condemned to the beasts;” and it is a well-ascertained fact that by this kind of death perished St. Ignatius, a most brave Christian martyr and disciple of St. John. The following is a detailed description of the general plan of the amphitheatre:—

1. *Ara*, or altar sacred to the Latin Jove.

2. *Postulae*, or little gates through which the wild beasts were admitted into the arena. We believe these to

have had gates, not only to regulate the ingress and egress of the wild animals, but also the water when the amphitheatre was filled with it; although perhaps stronger gates may have been used for the time being.

3. *Podium*, or wall surrounding the arena with its pillars, and the covered chair of the emperor in the middle.
4. *Præcinctio*, or landing-place, that is, the step here was higher and wider than the rest. Of this kind, Vitruvius shows there were three in the theatres: but in this number must be reckoned the first landing-place, which was near the *podium* itself.
5. *Vomitoria*, or avenues, with square little gates in the stone-work, by means of which the multitude was diffused over the seats. These were reached by ladder-like stairs, so that any one could reach his appropriate seat. The middle space between two of these stairs was called *cuneum*, forming seats in the theatre, narrower near the stage and broader behind, the form being like the edge of a wedge.
6. *Foramina*, or holes for admitting the so-called masts, which were supported by stays, for the purpose of stretching the awnings across the theatre.

Such was the amphitheatre,—a building which showed to what vile uses a nation like the Romans could turn all that they had learned from the Greeks; and in which, as the national vigour decreased, so did its cruelties and horrors increase. The gymnastic art had nothing to do with this beyond showing what could be done artificially with this framework of ours for cruel and base purposes;—not for the good purpose to which the Greeks intended it, namely, for the bodily and mental development which will ever serve to make

a nation *great*. That greatness, which was their own, and which after many thousand years is still undimmed, we may fairly trace to their system of education, at least when in the meridian of their national development.

To return, however, to the "battles." There were two sorts; in one kind they used weapons, and in the other generally none. The latter the Greeks ealled *skiamachia*—sparring, with us a private contest. It was ealled "a fight with weapons" where they contended two-and-two either with foils (*armis rudis*), or with cutting and piercing weapons (swords, &c.); whence the ancient name *monomachia* has been applied to both kinds, that is, the contest with blunt weapons and that with sharp ones. They are also termed *hoplomachia*, and are praised as being useful in diminishing grossness of habit. One writer declares that the *skiamachia* was a kind of battle in which a man fought against a shadow, both with his arms and legs. Plato speaks of it as fighting without an adversary. They not only fought with a shadow in this ease, but against columns and poles, or against a wall; sometimes on tiptoe, to imitate the boxers, sometimes jumping and falling upon their feet.

We are of opinion that all this was efficacious in procuring the ancients a very great amount of strength at any time when an adversary might be wanting, or when the person to be exercised was so delicate as to be unable to suffer injury (even of the most trifling description), which often happens in the contests with arms and the like. The arguments brought forward, both by Plato and Plutarch, were in favour of the "noble art of self-defence;" for the latter has written—"I see that you are now prepared against the necessity for contending in a private battle." It may seem, but it was not, a ridiculous thing, this fighting with shadows; and it affords an excellent

morning exercise for any one. The Apostle Paul is supposed distinctly to allude to this, where he says (1 Corinth., 9th chapter), "So fight I, not as one that beateth the air." Now it is reasonable to suppose that this contest was also of a more serious character. In Elis, near the river Alphæus, were celebrated, every four years, games sacred to Olympian Jove, and some of these ended with the death both of the vanquished and the victor. Galen tells us that the priests in Troy retained this ancient custom, exercising in the summer time in the *monomachias*. The Romans adopted them not only at their grand spectacles, but at costly private entertainments. Thus the combatants in these were termed *gladiators* (*monomachos*, a *gladiator*). Even in the time of Julius Cæsar these battles were sometimes fought in the Forum. Galen's disgust at these practices was chiefly and strongly induced from the battles of gladiators; having often to tend their wounds, when appointed physician to them by the magistrates. It was a battle instituted entirely for these gladiators, in which they both perished if they fought on, and died even when they ceased fighting. We are told that the rules among these men were, that when overcome by wounds they should send to their masters, who looked on to know what they desired—if their present condition were satisfactory, or whether they should fall down and die! They are said to have met death with such fortitude that the Emperor Antoninus could not bear the sight of the wicked destruction of these men. He was induced thereby to issue an edict forbidding their engaging with sharp iron, but with blunt and round swords, such as may be used for practice at the present day.

Another sort of debasement which sprung from this practice was the system of fattening them up like prize pigs, so as to bleed more copiously when wounded than ordinary men.

They were called *hordearii*, or barley-eaters, from the large quantity of barley they consumed, making the chief of their diet beans and barley-broth. It is said, at times, to render them more savage, they drank the blood of the slain. These contests, in truth, gratified alone a cruel thirst for blood. They were fed up at the expense of the muscular structure, their limbs often being exceedingly fat, so that they perished miserably. The "art" was simply in him who was so fortunate as to kill. Those wretched men who gave themselves up to the contests with wild beasts were often in the prime of life and youth, adorned, as we are told, in costly array, and thus voluntarily given up to almost certain destruction. We take the latter from the eloquent denunciation of these practices by a Christian writer, named Cyprianus, who, in addition, and while remarking that even fathers, mothers, and sisters, were drawn by the all-absorbing attraction of these contests to behold a son or brother thus sacrificed, declares that the very spectators were as *parricides* for beholding them! The grossness and depravity of these disgusting exhibitions are the more striking because both in times of republican liberty and under the emperors there were few persons, noble or ignoble, consuls or emperors, who did not regard with the greatest pleasure these human spectacles, in which every crime and cruelty were combined. In the time of Pliny's grandfather there were thirty pairs of gladiators in the Forum at Rome. There they were placed for hire, and were evidently selected from the lowest dregs of society, chiefly among the slaves. The Emperor Commodus, who was himself a choice specimen of the gladiator, seems to have been the only person of position who took personal interest in these combats, amusing himself with slaughtering these poor creatures. Some of the emperors exhibited these gladiators for the purpose of inuring soldiers

to matters of practical warfare by the sight of wounds and slaughter. Solon enacted a law for the Athenians respecting the effect which observation of the battles of fighting-cocks might have on youths, who, observing the tenacity of these winged contenders, and the firmness with which they held on with their beaks till completely exhausted, would learn not to be inferior to the birds, as well as to despise both dangers and wounds.

The abolition of these vile customs is said to be due to the Emperor Honorius. If they were copied in any way by persons generally, it was in shape of the fighting with an imaginary adversary, as was seen in the statue of an athlete, who was represented fighting the air. The *athletæ*, as already mentioned, exercised with the *palus*; and thus there was little lack of exercises for warlike purposes, both of offence and defence. Some were in the habit of going through the "beatings of the air" after a meal. Galen approved of the *sciamachia* for exercising both the arms and legs, though the *hoplomachia* was believed to yield the best postures to the chief members of the body. This exercise they performed with arms, as its name implies.

The simple effect of these contests, where no violence was used, was to produce both strong and swift exercise, and thus serve the purpose of reducing excess of fat or flesh about the body. They strengthen the arms, shoulders, legs, and feet in a wonderful degree, but produce giddiness in those liable to such attacks, and, as Galen ordered, are to be avoided by those who labour under kidney affections. The *sciamachia*, or contest with a shadow, was said to make bodies slender, agreeing with quick exercises, and, as such, properly stands as an exercise of the arms and hands. It suited besides, if we may trust their writers, sedentary affections inducing a sensation of lassitude,

strengthening the nerves and bracing the frame. It was also useful in mild chest affections, irritation of kidneys or bladder, with inactivity and loading of the colon or large bowel, by its strongly exciting an action in the extremities. In the same way good and similar effects were produced by fighting with the *palus* or "dummy," which brought out greater force from the arms when striking it than the air could possibly effect. Just in the same manner as the struggles of any one *with* an antagonist end in the entire exhaustion of one or the other. The latter, therefore, are exercises for strong and healthy persons, whilst those proper for weak and old men are the simple contests with the shadow.

With regard to the several advantages of games of different kinds, we find the same conditions among the higher classes of ancient times as with our own : in the former case they were left almost to the *athletæ*, and in the latter to the country people and lower orders of society. Still there were, and always have been, exceptions to this rule, for we have said enough already of the strong games and great exercises. Hippocrates thought that those games which were performed strongly and with the body erect, exhibited more labour of the external parts—heating, strengthening, and increasing the flesh. In the opinion of others they rendered the breathing firm and strong, improving the solids of the body, muscles, and nerves; thus strengthening all the natural functions. In what they termed dense and dry flesh, sharp exercise, interposed with rest, was fully approved. In certain pains of the head, melancholy, and indigestion, this bringing the body into a state of agitation gave great assistance to its functions; for all these associated movements diffused a general glow and warmth over every part of it. The games of the *palaestra* were strongly recommended in *dropsy* of a mild form, and undoubtedly extinguished, as they

are said to have done, many serious conditions of *satyriasis*. For the latter, strong muscular exercise is certainly the best of remedies. Exercises of the latter kind were, however, from their violence, particularly hurtful in fevers, for we find Hippocrates very properly denouncing another physician for killing some of his fever-patients by submitting them to the games. Hippocrates bid them beware of exciting local or general inflammations where there was a tendency to such, and especially where persons are delicate in the chest; though the latter applies strictly to strong exercises, of a purely active rather than a passive nature. As already said, they avoided these games in kidney affections, yet some of the Roman physicians did not interdict the palæstra to convalescents from kidney disease. Celsus cautioned against them in internal ulcers. These also referred to strong exercises. After sickness the gradual gentle exercises increased flesh and brought back health. Lycurgus even exercised the bodies of damsels by running, gaming, casting the quoit or javelin, so that at least from a strong and healthy soil strong germs should be produced. In ophthalmia, pains in the ears, quinsy, and hæmorrhages from any portion of the frame, Galen ordered them to be avoided. And, on the whole, Galen most strongly condemned these games, owing to the violence with which they were played. For he declared some persons ruptured vessels in the chest, some broke or dislocated their limbs, others were suffocated; and some disliked the game from its republican origin. According to him, it was better that men should be exercised in throwing, running, horse-riding, jumping, hunting, sailing, and digging, than in games or contests. In a medical point of view wrestling was an exercise he could not recommend. The grand maxim, according to Hippocrates, was that *persons well used to exercise should run and contest, chiefly in*

the winter season, but do very little in this way in the summer, save walking a good deal in cool shady places. Those who were fatigued in running might prepare them for it by wrestling, and by running for the general games, thus freshening up, as it were, those portions of the body most liable to fatigue.

CHAPTER VI.

Running and Leaping—Their several Effects and Uses—The Plummets and Dumb-bells—The Quoit—Throwing Javelins and Weights—The Exercise of *Walking*, its varieties, and great value to health.

AMONG the many aids which nature has given for the preservation of health and life, and which are not to be considered strictly as matters of labour, we find the exercise of *running*. For safety, general expertness, and health, it is invaluable. It is, with the rest of the animal creation, one of the most constant and enjoyable of those instincts which maintain them in health, and disperse the accumulations and dangers of inactivity. Mankind may surely profit by so universal a rule. With the ancients, the Stadium, or Course, was instituted and set apart for runners and persons who walked. Part of the training of the *athletæ* consisted in walking and running. There were several names given to various forms of running and riding, such as the *dolichus*, or long game of running; the *diaulus*, to the goal and back again; and the *ephippius*, on a saddle-horse. Not only was it an exercise, as it is at the present day, specially adapted for youths, but it was also highly serviceable for military purposes. Pompey's soldiers exhibited great efficiency from their agility in jumping, their velocity in running, and strength in contending with the bar. It is to the Stadium that St. Paul alludes (1 Corinth. c. ix.), when he says, "they which run in a race, run all, but one receiveth the prize," as

showing that the practice existed in full vigour in his day. Among the healthy, and yet not too severe exercises, some gave the first place to running. There were several kinds of this exercise; one running forward, one backward, and another in a circle. It was essentially an open air exercise. The *diavulus* was made up of two stadii or courses; each stadium was a *furlong* in length; and thus the latter is commonly met with in ancient writings as a term used in measurement. The *running*, when performed outside the Gymnasium, was in several places chosen according to its object as an exercise or trial of physical endurance. Flat places were often sought, or rough spots, level or not level, either meadow or mountain. Aristotle distinctly contrasts the healthy appearance of those who used this exercise with such as lived in cramped and crowded localities.

If, therefore, boxing was an almost special exercise for the hands and arms, so running was especially useful to the lower extremities, and was therefore much cultivated by ancient gymnasts, as well as recommended by physicians. Galen places it among exercises that are swift without force and violence. We gather from the words of Hippocrates that it attenuates bodies, and diminishes the flesh and juices. There were great differences in the way the running was performed, because some were swifter and stronger, others slacker and more placid; and from this cause it was customary to vary their effects in the manner of running,—some to the right, others obliquely; some forward, some backward; some with almost naked bodies, some well covered; and some performed in the same way upon plain, unequal, or mountainous ways. Hippocrates condemned it where symptoms of fever were present. It was an exercise for “sick spleens” then, and may be the best remedy for the “blues” at any time; for Cælius mentions that some were freed from every affection under

which they suffered by running and walking alone. To repel “the faults of the spleen” by *long running* was, according to Plutarch, to be read of in Demosthenes that physicians then prescribed it; and thus many went voluntarily into the sacred games, and some to escape the worst kind of racking pains. It must, however, be very carefully used as an exercise by those who suffer from head affections, or who feel the head to be affected by it; for swift motion necessitates the holding and retention of the breath, filling the vessels of the head in a great degree. Such persons might still, by a *gradual training*, gain the advantages of running, and that with impunity. Some considered that epileptics should be wholly restrained from strong running. Moderate and gentle running was very useful in simple defluxions and catarrhs, being adapted to divert these morbid actions in the body. Aretæus commended it in vertigo (doubtless connected with dyspepsia), and for leprosy; whilst Celsus exercised persons with dry coughs in holding the breath, but not in running. It was also used in ulceration of the fauces. For though at first it was found to increase defluxion, yet after an interval of time it restrained it. In cases of *sciatica* it was seen, as it might be now, that at the commencement of running persons could scarcely move the legs; but after a while, as they begin to hasten their movements, the disease appeared to be almost forgotten. As a means of bringing about the latter, and not only cutting short this painful disorder, but preventing the lameness and shrivelling of the muscles of the limb that so frequently follow, passive movements and rotations may be gently given, to prepare the patient for exercising in the above manner. This is not of course all that may be required to be done in *sciatica*, nor in every stage of that complaint. It is an excellent means too of giving tone to the stomach, and removing obstinate flatulency,—so

much so, that some used it in colic. The ancients distinctly assert that it depresses or removes tumours of the *spleen*, and that it should be used by the splenetic, and this advice is certainly worthy of careful consideration. It was found serviceable in diseases of the kidney, *seminis profluvio*, intus-susceptio, and to those who had been stung by scorpions. In severe kidney-affections, however, it was considered dangerous.

There are certainly many inconveniences attending an exercise of this kind, as in the nature of all remedies. The philosopher Aristotle, comparing it with walking, proves it to be more laborious, the body being less steadily sustained than in the latter ; yet there was seldom much damage from either of these kinds of exercise. If pains in the head or chest ensue, then running should be avoided, except in the gentle manner in the beginning we have before alluded to. The maxim of one physician of celebrity being, that persons who laboured under heaviness of head on movement, if they moved gently soon felt lighter ; but persons who ran, if before doing so they felt no heaviness yet after running were heavy in the head. In the first instance there is a diversion of the circulation to the extremities ; and in the second, a fulness of the vessels of the brain, occasioned by the effect produced by running on the breathing powers before described. According to Galen, shortness of breath and asthma may be removed by running ; yet in some there was constant danger of breaking bloodvessels, though only by the swift running, and that in those predisposed to such dangers. Where ruptures of any kind exist, it is to be avoided. That running increases the secretion of the kidneys, was well known in those remote times. Stags which run till they are taken with a want of this kind, are easily caught ; and this circumstance has been profited of by hunters, who follow them, and give them no opportunity of relieving a

natural want. To persons labouring under affections of the liver, running was considered hurtful. Running up acclivities is to be avoided by almost all persons, on account of the very dangerous acceleration of the action of the heart, and the temporary enlargement of the vessels of the lungs. Although many ran with little or no covering on their bodies, yet we learn that asthmatics were recommended to this exercise, and to be covered with linen garments at the same time ; by this means they were protected from the sudden effect of temperature when at rest, which is so trying to asthmatics. It is useful also for persons who suffer occasionally from the *muscæ volitantes*, or the dark spots moving about and changing their form before the eyes ; these appearances are often soon dispersed by active bodily exertion. Running is an exercise specially adapted for winter rather than for the summer season.

The *salma*, or jumping, of the Greeks, was probably one of the warlike exercises, to enable them to overleap ditches, and in fact to surmount without much labour any high obstructions of the enemy during battles and sieges. It was also an especial favourite in all athletic sports ; for, among the five games composing the pentathlon, jumping or leaping held the first place,—

“Saltus, tum discus, tum lucta, et jacula, cursus.”

There was a moderate sort of jumping, in which they held plummets of lead, of which Galen approved. It was an exercise *sui generis*, because to move hastily and to jump differ from each other, leaping being a movement more like running. In one respect it was in effect something like dancing, especially where they leapt without the usual running. Just as the *Salii* were wont, at the festivals in honour of Mars, to leap as well as dance through the streets of Rome. Women even, in some places, were trained to the high leaping,

though Aristotle testifies to the arduous character of the continuous movement of the leap. The small weights in their hands before alluded to were called *alteres* by some. It was said that in the *quinquertiones* and other exercises they jumped better if they carried a stone or plummet in the hands, than if they east about their empty arms. The well-known "dumb-bells" were doubtless taken from these ancient *alteres*, or *halteres*. The leapings were chiefly performed in the Stadium, where it was considered the greatest feat of all to leap the *skamma*, or trench, of that edifice. Sometimes they leapt on high from a low place, then from a high place to a low, extolling of course the greater labour of the leaping from the low to the high spot. They not only used the small weights borne in the hands, as we have said already, but sometimes bore heavier weights on their head or shoulders, and sometimes on the feet. But these weights only served in the performance of the stronger exercise, having a limit among those who sought health by it; but others, for the sake of exhibiting their powers, jumped long and high, laden with these heavy weights. There was also an amusing exhibition of persons jumping with their feet from the tops of bladders or skins full of oil or wine; and the victory was awarded to those who managed themselves so dexterously that, in spite of the slipperiness, they did not fall to the ground, these persons bearing away the reward of victory in the shape of a bladder or skin of wine. But those who struck the ground with their haunches, did not fail to afford much mirth to the spectators. The latter was an old custom observed in the games dedicated to Bacchus, called *askolia*, and the goatskins used were in derision of the goats, which were believed to be deranged by the vines. These are not to be confounded, however, with the *askoliastein*, which were leapings with only one foot on the ground.

Galen judged that jumping should be placed among strong exercises, such as are of a robust and quick nature, and especially such as are kept up continuously, without any intermission. By it the animal heat is developed, the food digested, and the secretions accelerated. Yet the head and chest may be often hurt by it, from the great exertion of holding the breath, whilst the body may receive a severe shaking. In women, it might produce *abortion*, and in persons subject to *hæmorrhoids*, or *prolapsus ani*, a sudden return of either affection may be produced by it. Carefully managed, the high-leaping will sometimes relieve long-standing pains or passive congestions in the head, and assist a chest wanting in healthy movement. It was said to be useful in gravel, between the attacks, though those unaccustomed to such exertion, should beware how they damage their ankles by some unwonted and frolicsome attempt. The body is, however, rendered very lithesome by the movements of the leaping on high especially. Aretæus recommended it in old pains of the head and vertigo. Those who suffer from ruptures, or from varicose veins, should shun exercises of this kind. But all the *gouty*, and those who from light causes suffered from affections of the feet, or swellings, the jumping was said to affect them in the same way as a purge or a bleeding. Galen considered that it supplied their places. Other authors very properly caution us against it, wherever there has been hæmorrhage from the kidneys. And with regard to the effects upon all those who endeavour to jump with their hands full, either of stone, lead, or anything else, there is less wrenching of the arms than if their hands were empty, on account of there being no resistance to their otherwise loose movements. So in throwing, when they take the heavy weight in the hand, no convulsion of the arms can occur. It is the same as in running, if a person moves his hands rapidly to and

fro, he runs more swiftly and easily than with extended hands, or hands at rest.

In addition to these plummets, of which we shall yet have more to say, we find that the *quoit* occupied no mean place in the Gymnasium. No game could possibly be more ancient than that of the *discus*, or quoit. It is even mentioned in the "Iliad" of Homer, where Achilles, in his quarrel with Agamemnon, removed his myrmidons from the fighting; and that they might not become inert he exercised them on the sea-shore with throwing the quoit, javelins, and in other suitable military exercises. Galen and others strongly approve it as a healthy exercise, whilst it was used equally by the *athletæ* and the entire populace. The *discus* we find with some writers signified various things; sometimes it was round and very heavy, so as to require the strength of one man to raise it. In the latter case it was a smooth globe of brass or bronze, and they moved it with the arm protected by a small shield, bound with a leather thong or belt. With this they cast it into the air. In other instances it was lozenge-shaped, round, and said to be called *discus* from its resemblance to the sun. A similar thing with four square sides, carried to table at banquets, was called a *discus*; and in this kind of vessel the head of John the Baptist was brought before the dancing girl. Some consider the *discus* to have been a plate of the thickness of three or four fingers, a little more than a foot long, either of stone or iron; so that it is evident they were cast very slowly into the air, lest they should be broken in the fall. In executing this, the *discus* is led to the breast, brought back towards the outside and downwards, to influence as it were its rotations when rising in the air,—

"Missile nunc disci pondus in orbe rotat."

This form was seen in the celebrated marble statue of the Discobolus, or quoit-player, and in another statue of the same kind, formerly in the possession of the Grand Dukes of Tuscany. In these statues it is so held that we are enabled to understand the mode of casting the discus. Thus it differs entirely from the flat lozenge-shaped discus, perforated in the middle, which was in more common use. There was great skill and practice required in throwing the discus, and the players were subjected to severe criticism from the spectators. It was from a lack of these qualities that Apollo is fabled to have killed Hyacinthus.

Next, as regards the *alteres*, or *halteres*—*plummets*, there were others besides those used in jumping, and already alluded to. The difference was perhaps rather in the mode of use, as they were thrown from hand-to-hand, or to a distance. In our own times their representative, the dumb-bells, are used in a more unwieldy manner, yet very serviceably, in throwing forward the chest, whilst they might be more advantageously passed from hand to hand. Aretæus recommends the use of dumb-bells in pains of the head. The annexed drawings of the *halteristæ* are taken from antique sculptured stones.

In order to avoid any mistake in terms, it may be mentioned that the word *alter* related to the exercise we have described, whilst *altera* belonged to the stage, or dancing, the former referring to the weights carried in the jumper's hands. Athenæus refers to the use of the latter among the natives of Sicily, and under the same name also the people of Ithaca used one that was considered symbolical of the fortunes and sorrows of Ulysses. Pausanias described the *halteres* as of roundish or oblong figure, not perfectly round, and that in using them the fingers were placed as if in the handle of a shield. Another physician mentions the use of wax in this

respect by those who had gout in the hands. This wax was given to be softened by constantly pressing it with the fingers, the hands being full of it. In the palæstra these were called halteres, and to make them heavier were sprinkled with particles of lead. Another form of halteres seems to have been



that of a sling, exactly similar to that occasionally used at the present day. The immense force of the sling skilfully managed is well known; and we can readily understand why David, in his encounter with the giant Goliath, should have selected this dangerous weapon, deeming it necessary against the strength of the latter's armour. In the Balearic Isles,

it was said to have been in such repute that mothers did not allow their sons to partake of other birds than those they had procured with the sling. Virgil gives it the title of *Balearie*, and it was undoubtedly in use in what were called the warlike gymnastics.

Galen himself has proved that a hard and strong exercise was done with the halteres, whilst the grasping and throwing weights of this kind were professedly to render great strength to the muscles and nerves. It was managed so that this exercise created heat in certain parts of the body, and especially the back, which appeared to be the part chiefly strengthened with tossing the plummets. Galen specially ordered the superior parts to be exercised by it; and before him, Aretæus approved this kind of exercise in chronic pains of the head, which gradually abated, also in painful diarrhoea with vertigo. In difficult digestion, acidity of stomach, and general debility of the latter, it was very properly recommended. In addition to the plan already mentioned for exercising the *gouty* with wax, wood with a piece of lead enclosed was first added, till these patients could use the more heavy kinds (p. 168). “Galen euidam, qui mordax præcalidumque semen inter emittendum sentire non tantum se, sed etiam mulieres eum quibus rem haberet, referebat, inter cetera auxilia, sese halteribus exercebat, suasit: quem postea secutus Alexander Trallianus in priapismo curando huiusmodi exercitationem commendavit, quod animadverteret ipsam non modo ad rotundendum infirmandumque semen, verumetiam ad materiam in diversum trahendam, spiritusque flatulentos digerendos conducere.” In the same way Galen approved this exercise in the cure of ulcers of the legs, which was effected by diverting the circulation from the inferior parts, or the humours as they thought. He looked upon it as a good substitute both for purgation and

phlebotomy, when they were required, and when neither the time of the year nor the wishes of the sick person permitted either. But there was justly considered to be great peril either to the head or the chest if either the one or the other were unequally agitated, owing to the force used with the arms. The digging, which Galen made both work and exercise, seems to be preferred. Martial sets forth the latter in the following couplet :—

“ Quid pereunt stulto fortes haltere lacerti ?
Exercet melius vinea fossa viros.”

It is very serviceable to exercise the spinal processes and spinal nerves, improving the circulation in the column, but should be discontinued if the head be at all affected by fulness or pain during the exertion. A patient should usually begin by throwing a dumb-bell from one hand to the other, slowly and gently. And in these cases the best exercise would be moving the arms in various directions, backwards and forwards, and twisting them, without the aid of the dumb-bells at all.

Galen mentions that among the ancients throwing the quoit was a strong exercise, and even to this day it is in use with many nations, so that it must not altogether be allowed to depart from its ancient position, as they said, *siccis pedibus*. It was by them adapted for persons who were denied the swift exercises, being perfectly suitable to the weakly, and yielding a moderate degree of strength to the inferior extremities and lumbar region. A considerable effort is required to discharge the quoit to a distance. We have already said that this author recommended it instead of purging or bleeding. Yet they forbade it in kidney disease or affections of the chest, lest hæmorrhage should follow the exertion. There was then a clear distinction between the halteres and the discus or quoit.

The ancients were so convinced of the value of this kind of exercise, that they gave out that both Æsculapius and Apollo were masters of the art of throwing the quoit. It was not so severe an exercise as throwing the iron bar or javelin, for hernia was said to be produced in some cases by the intense exertion of the latter. The lighter form of casting arrows as an exercise is also shown in an account given of one Philoctetes, who, when racked with almost unbearable pains, and despairing of his life, employed himself in fowling, that the exercise itself, or the delight which sprang from it, might benefit him, either of which very probably resulted from it.

With regard to the exercises of throwing, one kind, of arrows, called the *sagittatio*, and the other, of spears, the *jaculatio*, there need be little said, except that they were exercises for purposes of war. They were, however, very useful, for Hippocrates has chronicled that many of the Scythians, from weakness of the shoulders and relaxation, were neither able to hold the bow nor hurl the dart, whilst he alludes elsewhere to the effects on the arm by slinging the dart, throwing the stone, and also from boxing. Great strength and practice were doubtless necessary in the use either of the *balista*, the *catapulta*, or the *scorpii*. At the public games or spectacles, in which wild beasts were introduced, as in the times of the Emperors Commodus and Domitian, the chief skill in the use of arrows and darts was manifested. That both the bows and balista were effectively used as instruments of warfare, we may gather from the expression, "it snowed arrows, and hailed lead and stones."

But we now come to one of the most valuable and important of all exercises, inasmuch as every person, however unfitted for serious exertion, can in its various degrees avail himself of it. While considering it we are instinctively drawn to a contemplation of the wonderful artifice and singularity with which

Providence has framed our feet. Therefore the Almighty has assigned *walking* as a constant movement with us, and that it should be managed with great care every one must perceive, and for this reason, that if anything can be done by exercise in the way of preserving or restoring health to the majority of persons, that exercise is walking. With the ancients it was greatly esteemed, as we find, in the Gymnasia and other places; and both before and after the time of Vitruvius in many cities there were constructed numerous places for walking, magnificently decorated. The former embraced three kinds—*porticoes*, *parades*, or *subterranean walks* for coolness. For sometimes a portico was joined to a theatre, sometimes to a temple, and to the houses of illustrious men. Galen tells us that, in the same way, the porch before the baths was used for walking. At one period they were erected alone and distinct, many of which were to be seen in ancient Rome, the most celebrated being the Pompeia, to which Ovid refers, where he says, “You awhile ago walked at leisure under the shade of Pompey’s Porch.” Other writers also speak of it. This porch of Pompey was evidently built for walking up and down in, and it caused many others to be built at the same time. Even in more recent times places have been set apart for the convenience and enjoyment of walking, and these were at one time planted with trees, at another without. Vitruvius has most clearly pointed out after what fashion the latter were disposed in the Gymnasium as well as out of it. They were to be seen to perfection, according to Pliny, in the Academy at Athens, which was planted with the most beautiful plane-trees; and it is supposed that with this Academy for his copy, Alexander Severus grew trees in the public bath and in his own.

There can be little doubt that numerous other places for walking, and at the same time avoiding the summer heat, were

made underground, in the shape of vaults or grottoes. Yet many of these places may have been merely covered passages, sheltered by walls, to prevent walkers being injured by winds and other injurious atmospheric influences. Such were seen in the ruins of the villas of Lucullus, and in the country around Tusculanum, as well as in the pleasure-garden of the Vatican at Rome. Those who had not crypts to their houses seem to have erected earth-works to protect them in walking. Most persons, too, arranged their places for walking according to the seasons. Pliny reports that Sostrates, a native of Cnidos, and a most celebrated architect, was the first who erected a promenade on arches. The *athletæ* were not exercised much in walking, and although many persons walked in the *xysta*, yet the *athletæ* were kept apart, only walking after violent exercise. This was enjoined by the physicians, who termed it *apotherapia*, which means the precaution taken after exercise, of walking slowly for a short period. What the *apotherapia* was, we may explain by and by. It may be thought, in the same way, that the students of military exercises little regarded walking, except what was understood by marching. Indeed, it was provided in decrees of Augustus and Hadrian that, once a month, the foot soldiers—just as the cavalry were taught horse-exercise—should be compelled to manœuvre, not only in the open field, but to ascend and descend steep and difficult places, so that no chance or circumstance could happen in the field of battle which good soldiers had not experienced before during their exercises.

This exercise had, moreover, many conditions dependent either upon the nature of it or the place chosen. As to its nature, Galen has defined walking to consist in motion and repose of the legs alternately: the motion itself, and consequently the walking, were either great or small, swift or slow,

strong or slack. In regard to the place of walking, all depended upon whether it were taken within or without the city. Xenophon mentions one man who declared that while following on foot in the field, his servant leading his horse, he enjoyed the walk greater than he should had he walked in the xystum. Sometimes it was taken in open places, sometimes in rough and sandy places, which Æsculapius and others recommended to paralytics. In Aristotle full mention is made of the equal, the unequal, the long, the brief, and all the others. Again, walking is divided into different kinds, according to the end proposed, whether, for instance, it is used as an aid to health or a good habit of body, or for the purpose of recreation. It is an excellent rule, that after the great exercises are dispatched there should not be a too speedy return to quiet, or from contrary to contrary. There was a shorter or slacker walking exercise which they called *apotheraponticon*, which men used after taking medicine or after vomiting—the vomiting being that which was probably induced. Galen also praises that already called *apotherapia*, which was used by the gymnasts in the middle of their labours, or during all the most powerful of the heavy exercises. Walking exercise was used by some to excite thirst, doubtless the thirst of wine; for it was one of the faults of exercise, that it was made by some subservient, not to health alone, but to indulgence.

Although there is no exercise so universal as *walking*, yet few can be found who have perfectly considered, either from reason or experience, in what way it profits or injures the body. This we believe arises simply from negligence of the principles of exercise, to which the present generation are certainly more given than the ancients were. Walking, among the Greeks and Latins, was associated with all other exercises, so that at the present day some would erroneously look upon it as hardly an

exercise. Still there are great varieties and shades of difference in it, both as respects the place in which it is performed and the time of performing it. In the matter of *motion* or *movement* there are many shades, such as whether it be quick, slow, strong, slack, short, long, or intermediate between the latter two. With the ancients also it was considered either as performed with the entire feet, the tips of the toes, or the heels. From the *place*, because of its performance on mountains, or on level ways, the latter comprising the undulating and the flat; and, again, under cover, in the open, or in the sun. From *time*, because some are used in winter, or in summer, in the morning or the evening; some before food, some after food. For all these discriminations were really of medical value with the ancients, and should be so in a measure with ourselves; whilst we find them alluded to in the above minute particulars by many old authors.

Yet it must be borne in mind that in those remote periods it came into use chiefly, as before mentioned, after the greater exercises were finished,—after taking medicinal purges, after anointing the eyes, and after copious vomiting. And this kind of walking is suitable to unbend the mind, to change the breathing, to regulate it and clear the chest, rendering the respiration easier, strengthening the stomach, and enlivening the senses. It is also to be prescribed in every affection that brings a sense of weariness, or which disturbs, unhinges, or relaxes. Hippocrates remarked that the object of walking after exercise was to ease the body, to purge it of the sweat induced by previous labour, whilst it did not induce the latter. The plain, moderate walking was more in vogue than all the rest. It was part of the Roman rule upon which health depended, namely, good and perfect digestion of food, walking without fatigue but with moderation and satisfaction, and ready action of the bowels.

That walking was most profitable which was purely relative to the strength and calling of the individual. Seneca confesses to have greatly relieved himself of the dropsy by walking. It was recommended for the insane, and C. Aurelianus commends it in curing asthma, whilst it is most of all useful in indigestion and heartburn. In *Asthma* it is, in common with the effect of strong exercise, sure to relieve; many persons have warded off attacks by long and severe exercise upon the feet. The latter, with care in diet, are two of the main features in the treatment of very many asthmatics. Archigenes, another Roman physician, found it useful in the cure of serofula and jaundice; and it is equally efficacious in the suppression of certain secretions, and in inactive bowels. Indeed, it may be said that no one can expect healthy action of the bowels who neglects walking exercise. It maintains, moreover, that equable balance of the circulation, which the sedentary habits of many, and we may say most people now-a-days, would destroy.

Walking, as we have said, is hurtful in all fevers, and is hurtful to such epileptics as suffer from dysentery, hæmaturia, or certain forms of weakness. In excess of fat and in distended colon, with or without pain, rapid walking is highly useful. But slow walking affords equally advantageous conditions to the weak, to sickly old men, those who choose to walk after food, and those who have just awakened from sleep, or who wish to prepare themselves for greater exercise. Hippocrates and others suggested something of this kind to those who suffered from slowness of digestion on rising from food, the idea of the ancients being that it got the food to the bottom of the stomach. The latter of course is with our present knowledge a very imperfect explanation of the real effects of this proceeding; digestion is, nevertheless, in some cases, assisted by it, and especially if the sufferer go for a short time into the open

air after sitting in a close heated apartment. The latter is desirable for many, if only for a few minutes, so to withdraw into the air, winter or summer, after rising from table at what is called a "dinner-party." In pain of the head Aurelianus has suggested very properly exercise of this kind, at first slowly, then moderately, but more strongly; and after a little while with legs extended and body erect to move more rapidly over the ground. He also approved of gentle walking for epileptic patients, as the head seemed to be relieved by it without any concussion happening to it. For the latter advantages Galen also speaks of it as assisting in quartan agues, when the paroxysms are not present, bringing less fatigue to the patient than standing on the feet. They approved of it in difficulty of breathing, doubtless from obesity, in *herpes zoster*, and in curing *elephantiasis*. They equally disapproved the too rapid or long walking for epileptics. The ancients were quite aware of the fact that a longer walk than usual will bring on a fit of the *gout*, as we know at the present day to be the case; yet they failed not to recommend it strongly during the remissions of gout, giving also the excellent advice that those who were gouty, or afflicted with affections of the articulations, should be moved about most powerfully *before*, but not *after* food. But great caution should be used where there is a suspicion of dangerous *atrophy* commencing in the frame, as the ancients forewarned as well as blamed those who put their patients in peril thereby. The short walk often fatigues more than the long one, and therefore they condemned it in epilepsy. It is supposed they allude here to continuous slow movement upon the feet and standing about, which leads to a peculiar affection, which many policemen have been known to suffer from, namely, destruction of the integrity of the arch of the foot through yielding of the ligamentous structure. They are

thus lamed for life, and rendered unfit for the service. Walking in a straight line suits the condition of all convalescents, and should be carefully attended to by the majority of such. A very strong exercise may be produced by an ancient method of walking, which consisted in pressing heavily upon the heels, thus using the muscles of the lower extremities; and in those days it was recommended for affections of the head and chest, suppressed evacuations, and where there is a tendency to local congestion of the upper parts of the body. Indeed, it was observed that even exercise of the fingers relieved the dimness of sight and slight determination of blood to the head.

Among the kinds of walking which have their origin in the *place* where they were performed, we may mention those which are taken upon mountains, exercising the body by ascending and descending. In ascending the whole body is fatigued, as we all know. Whilst this is a powerful and serviceable exercise, it should never be taken immediately after food; and the impetuous action of the heart, which in some persons produces faintness with momentary loss of vision, should warn all such that they ought carefully to proportion the periods of rest to the amount of active exertion. Through neglect of these precautions the seeds of organic disease are often sown. A degree of training should be previously gone through by aspirants after Alpine honours, or even by ordinary tourists. Just as it was said of Demosthenes that he accustomed himself to walk in ascending, and between his walks to pronounce his orations, because he thus accustomed his breathing to the exertion which orators find necessary in speaking. On the other hand walking on declivities is very fatiguing to the extremities, though it is a most excellent exercise for them and most agreeable to the head.

The walking which is performed on smooth and level ways

produced, in the opinion of Aristotle, and we believe most persons, uniformity in the labours of the body, and from the likeness it bears to labours which are rapidly and easily finished, it is also better accommodated to uniform conditions of breathing as well as to the body generally than when performed in uneven places. But as on the smooth level ways we are disposed to walk quicker, the uneven ways are often less fatiguing on that account; and it was from this circumstance that the ancients considered walking in the public roads less fatiguing than in places set apart for it. In these respects walking had, as now, several divisions, being sometimes performed in meadows, or in rough places on the sea shore. In the former its operation was softer; the senses were little agitated, and were often delighted with the odours of herbs and plants springing from the ground. The hardest exercise of this kind was that on the deep sand of the sea-shore, though it is to the whole body and the senses, from the nature of the atmosphere around, an invaluable form of strong exercise. For the sake of this it is said the Roman Emperor Augustus, having a weakness of his left hip, thigh, and lower extremities, hobbled about there, and thus augmented his powers of locomotion. In this way we can understand what Suetonius means by the use of the sea-shore or sand, in a place full of reeds, as a remedy; the reeds being useful to keep the patient going, and impede halting. Some recommended their paralytic patients to be exercised by walking in sandy places. Celsus and others very properly condemned walking under porches, or closed places, unless these were situated on an eminence far removed above all vapours. Health is obtained by the pure air around, an advantage which a whole day's walking about a house would fail to secure. It is remarkable how pertinaciously some persons cling to the notion that

running about a house during the day is equivalent to out-door walking exercise, and neglect the latter on that account. The ancients then rarely used their *crypto-porticus*, except during rain, tempests, or violent winds. The effect of the green fields and shrubs upon the sight when walking in the open air is a matter not to be lost sight of. The radiation of heat, the action of the skin, and the obvious elasticity of the entire frame, are conditions only apparent in the clear fresh air of the fields or lanes. The ancients always avoided stagnant waters in this respect, and Aretæus distinctly condemns these in epileptic cases. To be well blown upon by the wind appears also to have a beneficial effect on the excretions and secretions of the body, as made known to us by the bracing sensation we experience from it. Ætius ordered this exercise to be taken in the blustering winds for colicky pains arising from cold; but if in the north wind it excited coughs, and hurt the chest, but at the same time revived failing strength, bringing vigour to the senses, and strengthening the feeble stomach. Of this C. Aurelianus probably spoke when he ordered walking in the open air to be used for strengthening the stomach. Under the south wind it was thought that the head was filled with blood, the senses weakened, the bowels softened, and the dejections had a tendency to become more fluid.

Walking in the sun or shade of course produced far different effects. Celsus declared that, if the head could bear it, it was better to walk in the sun than in the shade; better in the shade formed by walls and shrubberies than under a roof. The walking in the sun is most serviceable in winter, and should be sought by every one at that season. In the summer, in almost any latitude, it is to be avoided; but it is better to walk than stand still under the summer sun, our very movement through the surrounding atmosphere carrying off some of the absorbed

heat. The shadow of walls or vines was considered a good place for walking, except there were too many or noxious trees or shrubs in these spots. With regard to dew, especial care was taken in those days, whilst we, with our advanced knowledge, as we suppose, almost entirely neglect it, and add to the mortality among Europeans in tropical, and even extra-tropical, climates. Under this term also they alluded to the effects of miasma; and we may here remark that there is much which experience will bear out in the belief of many persons, that when under cover we are almost safe from the effects of miasma. This has reference to persons who necessarily, or otherwise, expose themselves, in various parts of the world, to the night airs, and have been found, as said before, if sleeping with a simple covering of an awning, protected from the usual dangers of exposure. It would have been attended with risk of fever to have slept in the open air in these spots and places without this covering, or one of some kind or other. Speaking of *dew* also reminds us of the excellent plan the ancients originated to get the fair sex up early of mornings by inducing them to believe, and with some truth so far as results went, that drinking the dew produced gracefulness of person, whilst they strove to get rid of obesity by collecting the dew in linen garments, in which exertion they consumed a good deal of superfluous flesh.

Aretæus, and others, approved of epileptics, and persons subject to attacks of vertigo, walking under the shade of the myrtle and laurel trees, or among sharp and strong-smelling herbs, as pennyroyal, thyme and mint, chiefly cultivated, and in quantities. But this should be done under a bright, clear sky, and not in heavy cloudy weather; for these two conditions affect respiration very materially in persons so afflicted.

There is little to add to the foregoing on the subject of walking. Whether in the morning or the evening it should be

taken *before food*. That in the morning promotes an action of the bowels, dissipates the sloth contracted by sleep, frees the breathing, augments the animal heat, and rouses the appetite; and it suits, according to Hippocrates, relaxed or lymphatic temperaments especially. That it agrees also to walk gently after food is known and recommended in the case of supper, but it does not equally apply to so heavy a meal as dinner; though there are cases, as we have said elsewhere, in which the latter practice is advantageous. One physician of ancient times, named Diocles, recommended phthisical patients to walk after dinner, and though condemned by many it had nevertheless its advantages, especially if taken gently and in the open air. The old notion was that when digestion was disturbed the vapours rose to the head and there turning to moisture were made to flow into the chest and lungs, which was of course considered very pernicious to a phthisical patient. This long continued to be an accepted theory, utterly useless, however, to the practical physician, yet prefiguring as it were our present knowledge of the *unity* of the human framework.

CHAPTER VII.

Standing Erect upon the Feet—Modern Examples of the Effects of Position—
Ancient Exercises with Ropes—Holding the Breath—Effects of the
latter ; also of Vociferating, Singing, Reading, Talking, Laughing, and
Weeping.

THERE was a notion among the ancients, that *standing erect* was in some way to be considered an exercise. If not the latter, it was at least a great *effort*,—fatigued more than walking,—and produced, as we have shown in the case of policemen (p. 179), grievous damage to the arch or arches of the feet,—that is, if continued day after day for many hours together, and for a long period of time. On account of the great effort which it induces in the muscular structure they had used it in treating epilepsy. A sort of exercise seems to have sprung from it among the ancient gymnasts, in which a person stood firmly on a shield or disc, and others endeavoured to move him by drawing with their hands the shield from under him. On the other hand, it was well known to Hippocrates, that ulcers of the limbs required *rest* for their treatment and cure ; and it is found that this principle of the Father of Physic is more and more recognised in modern surgery. This question of standing was doubtless put to practical test in those days, in which all who beheld the athletic games seem to have stood, that the boarded floors of the amphitheatres might hold a greater number of men ; yet in many instances they were

allowed to bring seats, each for his own accommodation. The latter were also at times used as weapons during disturbances in those places, and this habit, namely, of fighting for places, first grew up in the time of certain consuls, till at length it was provided by a decree of the Senate that these seats should not be set down in the city, or brought nearer to the theatres than a thousand paces, nor was it permitted to behold the games seated. This, however, must have related more to religious festivals, because the amphitheatres, whose ruins we trace, were all constructed to afford seats to [the bulk of the spectators attending there; and it is further recorded that a law of ancient Rome provided that the worshippers should stand erect, and sacrifice to Jupiter standing. It was also ordained to prevent the possibility of their going to sleep, and in order to show the gods more reverence. They saluted the altars of the gods with uncovered head, and as we now bend the knee in adoration and praise, so it was then considered an act of greater reverence to worship standing. Yet some advised the worshipping to be done sitting, by which was signified that their vows were firmer and more steady. It does not appear that in exercising troops for war, "standing erect" was much used; nor can we see that the exclamation of Vespasian, that "an emperor should die standing," has any reference to this beyond the fact which he obviously meant to convey by it. It is useful after taking food, and there will ever be much truth in that very old maxim, that "after dinner you should stand, and after supper walk." Standing in the sun and shade had different effects; the chief was, that many fevers were traced to standing in the sun, and those, not purely connected with the head. The uncle of Pliny had, notwithstanding, very peculiar notions on this head, for in the summer he used to lie or stand in the sun when he had any leisure, after food,

though the latter was always well chosen and easy of digestion ; and a little while before the breaking out of the eruption of Vesuvius, he was wont to drink cold water in the sun. It must, therefore, be taken as a general rule, that it was the only exercise taken after food,—if it may be called an exercise. Some persons also, who cannot walk, may find a sort of comfort, if not an exercise, from standing erect.

Regarding the effects produced by standing erect, the ancients viewed it as being more wearisome than active exercise, and it was, therefore, hurtful to those who had weak spines, and those who suffered from affections of the kidneys ; and they were certainly correct in warning all those who suffered from *hernias* and *varicose* veins against it. The poet Juvenal indicates this, where he says of the priest or sooth-sayer at the temple of Janus that, owing to his standing so constantly to attend to the importunate women who flocked thither, he would be afflicted in this way,

“ ————— *varicosus fiet haruspex,*”

To stand before food was considered useful to asthmatics, and where difficulty of breathing existed, as in both instances it dispersed the flatus. To persons of slow digestion, lying with the head raised considerably was deemed of service ; and to a moderate degree, with a hard pillow, it is undoubtedly a more agreeable and suitable position for such persons, many of whom have an apoplectic tendency. Standing after dinner, if useful to digestion, is certainly so to those who want to add more to the stomach already laden to repletion. We have heard of a ragged-school scholar at one of the annual feasts, testifying to this fact in a very significant manner. One of the patrons of the school had observed this youth, after unlimited helpings of the roast beef and plum-pudding, still looking longingly at the

remnants on the table, although himself almost in the passive condition of a rock snake in the jungles of India, after swallowing a buffalo or other large animal. On being questioned as to whether he could "take any more," his ready and laconic reply was, "I think I could, sir, if you will let me *stand up*!" Here he instinctively knew that *space* would be gained, if not digestive power.

The reason why standing in the shade was not practised by Pliny and others, and was disallowed by physicians of those days, is to be traced, doubtless, to the fact, that in those climes it was either in cold, droughty, shut up, or damp places, or under noxious trees or other pernicious influences. The standing in the sun some praised in those who were dropsically inclined, or of cachectic habit. It is to be found in the works of Archigenes, who wrote on fevers in the reign of Domitian, that lying in the sun was used in the cure of jaundice. There were many modes of using the sun in this respect,—some when anointed, others without; now sitting, now lying, now standing, sometimes walking, sometimes running; though it was admitted that, without previous purgation, lying in the sun affected the head. So that it is wonderful how Pliny bore this, though it may have been due entirely to his abstemious habits. He was very corpulent, and the mode of his death is well known. This standing in the sun was more dangerous, because heads were usually uncovered in ancient times; but all admit the safer plan of covering the head as well as clothing the body when exposed to its rays.

We shall now digress a little for the purpose of affording our readers a few modern illustrations of the effects of position. The old Hippocratic law previously alluded to has been ably carried out by a living surgeon of repute, who has recently published an account of his researches in the treatment of

several disorders of the frame in which *rest* (physiological rest, as it is properly termed) is the main element of a successful cure. In affections of the knee-joint, varicose veins, and urinary fistula, it may be considered invaluable as a means. Affections of the bladder especially forbid exercise of almost any kind, and the revival of this ancient method, for there is nothing new under the sun it would seem, is a great boon to society and the afflicted.

With regard to the kidneys in relation to *diabetes*, modern research seems to have established the fact of the *liver* being in this instance the chief organ concerned in the production of sugar, which is thrown into the blood with the ordinary hepatic fluids. The kidneys, therefore, are the organs which serve to eliminate this excess of saccharine matter, though they may become hypertrophied or enlarged in consequence. A curious illustration of the nervous origin of *diabetes* from *changes of position affecting the vessels of the brain* was given by Dr. Richardson, of London, in a lecture published in March of last year. He says, "I brought a man here last session suffering severely from *diabetes*, from whom we had direct evidence that the excretion of sugar could be increased by one simple act, that, namely, of *throwing back the head, looking upwards, and retaining the posture*. That man was by occupation a house-painter, and he told us definitely, and with great intelligence, that the first symptoms of his disease always came on when he was in the act of washing or painting a ceiling ; that he would work for hours at a wall without any particular pain or oppression, but that so soon as he mounted his steps and began to look constantly upwards, so soon the frequent desire to micturate was developed. I explained then that the position of the head must produce such peculiar influence by an interference with the circulation of the base of the brain, and probably of

the vertebral arteries, and I surmised that this man, if removed to a more compatible occupation, might recover, or be greatly relieved. The surmise proved true; this patient is still living, and the last time I saw him, he considered himself well, although there was still evidence of excess of sugar."

With reference, however, to the importance of careful exercise in disorders of the kidneys and stomach, Dr. Bence Jones tells us, in a clinical lecture delivered in 1854, that, "there is an appearance of red sand through *rest*, which not unfrequently gives rise to *calculi*."

The recent supposition that the cause of the coagulation of the blood is due to the evolution of ammonia, appears now to be discarded for the more mechanical view of that phenomenon. It is evidently due to anything which produces obstruction, and the coagulation, after it has once commenced, is said to "travel inwards like advancing crystallisation towards the centre of the mass." Thus it is plainly under the same influences that are found to affect ordinary matter, differing only in a higher and more mysterious degree. In the pressure resulting from venous obstructions, we have dropsical effusion of the liquor sanguinis, and a consequent illustration of a purely physical condition. On this subject we would refer the reader to the Croonian lectures of Mr. Lister, Professor of Surgery in the University of Edinburgh, who views the coagulating of the blood in the influence that may be exerted over it by ordinary solids, which attract the coagulum.

In Article 6295 of the Journal of Practical Medicine and Surgery, 1862, is a very interesting account of a popliteal aneurism cured by *flexion*, showing the effects produced by *position*:—"The patient was a man, aged sixty-one, who for some months had been affected with a gradually increasing and painful tumour in the left popliteal space. A swelling, some-

what larger than the closed hand, occupied that region a little above its middle; it was the seat of distinct throbbing and expansion, soufflé was present, and pressure exercised on the femoral artery over the pubes caused the pulsation, expansion, and soufflé to cease, without, however, in any perceptible degree diminishing the size of the tumefaction; no doubt could, therefore, exist as to the nature of the case."

"I remember," says the writer, "while imparting certain movements to the leg, that the pulsations became less distinct in proportion as I increased the degree of flexion of the extremity, and I ascertained that, *when the knee was bent to the utmost, the throbbing and soufflé entirely ceased.*" This circumstance induced him, before resorting to operation, to arrest the circulation in the aneurism. "I therefore," he says, "caused an apparatus to be constructed in the shape of a leather cap, laced at the side in order to enable the surgeon to increase gradually the constriction, and destined to fix the leg and thigh in a flexed attitude; its shape resembled that of the paper which envelopes a loaf of sugar. This very simple apparatus was found unendurable by the patient. After two days he declared that he preferred death to the torture inflicted on him, and especially complained of the necessity of absolute immobility in bed." This, however, was soon remedied by the following plan, which proved perfectly and completely successful. "The entire leg was placed in a sort of long stirrup, constructed with a small table-cloth, supported by a strap which rested on the opposite shoulder, and the patient was directed to keep his knee as much bent as possible, to move as little as he could, and on no account to remove the dressing at night. These orders were strictly complied with; he left Geneva, and returned to the country, where he faithfully kept on the apparatus for eighteen or twenty days and nights. In a few days he

observed a marked decrease in the pulsations of the tumour, and when the stirrup was removed altogether they had entirely ceased. During the treatment he had moved about in his apartment like a man recovering from amputation. The tumour gradually diminished in size, and when I again examined the ease on the 12th of June of the ensuing year, I found in the popliteal space nought but a hard nodus of the size of a pigeon's egg, in which no throbbing was perceptible. A complete cure had evidently been effected." This ease seems to be identical almost with one successfully treated subsequently by a Mr. Hart in England, and alluded to in the same article.

In another Article of the Journal of Practical Medicine and Surgery, we have a very interesting proceeding of Dr. Priou in a case of *incarcerated hernia*. It is styled "Inversion of the Body in the Reduction of Hernia," showing a very striking proof of the aid afforded by position of the body. The proceeding is thus described:—"Climbing on the bed, on which the patient was horizontally stretched, and placing myself between his legs, I seized them under the knees, and raised them in such a manner as to elevate the pelvis as much as possible, and completely *invert* the body. At the same time an assistant was directed to press the extruded intestine downwards through the ring, whilst I imparted gentle succussion to the body, in order to direct the viscera towards the diaphragm, which, by the inversion of the trunk, had become the most dependent portion of the abdominal cavity."

This method is well calculated to facilitate the dislodgment of the incarcerated intestine from the inguinal canal. In 1844 (see Article 2724 of the same Journal) it was successfully done by Mr. Hirigoyen, who placed the patient's legs on the shoulders of a vigorous man, who grasped them in his hands; but Mr. Priou's plan seems to be preferred.

Pressure on the abdominal walls, or external manipulation, has recently been most successfully applied in obstetrics in bringing about "bimannual version," as it is termed; but the particulars of which are scarcely within the province of a work of this nature. Yet *pressure*, as applied to the reduction of inguinal hernia, has long been a justly favoured method with certain French surgeons of professional position and repute.

Many may have heard of the "ready method" of Dr. Marshall Hall to recover persons from the effects of drowning, or asphyxia, and Dr. Silvester's plan also, the latter of which was approved and recommended by the committee appointed to investigate the subject of suspended animation, whose report, which we quote, was published 1st July, 1862:—

"In the treatment of *apnœa* generally, the committee offer the following suggestions:—

"That all obstruction to the passage of air to and from the lungs be at once, so far as is practicable, removed; that the mouth and nostrils, for example, be cleansed from all foreign matters or adhering mucus.

"That, in the absence of natural respiration, artificial respiration by Dr. Silvester's plan be forthwith employed in the following manner:—The body being laid on its back (either on a flat surface, or, better, on a plane inclined a little from the feet upwards), a firm cushion or some similar support should be placed under the shoulders, the head being kept on a line with the trunk. The tongue should be drawn forward so as to project a little from the side of the mouth. Then the arms should be drawn upwards until they nearly meet above the head (the operator grasping them just above the elbows), and then at once lowered and replaced at the side. This should be immediately followed by moderate pressure with both hands

upon the lower part of the sternum. This process is to be repeated twelve or fourteen times in the minute.

“That, if no natural respiratory efforts supervene, a dash of hot water (120° Fahr.) or cold water be employed, for the purpose of exciting respiratory efforts.

“That the temperature of the body be maintained by friction, warm blankets, the warm bath, &c.

“In the case of drowning, in addition to the foregoing suggestions, the following plan may be in the first instance practised. Place the body with the face downwards, and hanging a little over the edge of a table, shutter, or board, raised to an angle of about thirty degrees, so that the head may be lower than the feet. Open the mouth, and draw the tongue forward. Keep the body in this posture for a few seconds, or a little longer if fluid escapes. The escape of fluid may be assisted by pressing once or twice upon the back.”

Besides the exercises already enumerated, there appear to have been numerous other kinds practised in the gymnasia, as Galen himself observes. One of these was the ascending a rope by means of the hands and other parts of the body; whilst the tight rope was not unknown, men walking and dancing upon it with the balance-pole as they do at this hour. These facts were discovered by means of the figures and general sculpture of certain antique gems. Galen places all these under the denomination of the stronger sorts of exercises. The *rope-dancers*, called *schœnobate*, wandered through the country for the sake of gain, exhibiting their skill to the people of those ancient times. There was another kind called the *skaparda*, in which there was a beam or upright fixed firmly in the ground. On the top of this was a hole through which a rope was passed, each end of which was joined to a smaller rope which was passed round the players, and whoever had strength

to draw his antagonist to the top was the victor in the game ; but if the other, while resisting, managed to fix himself so that he could be moved but little, the victory was entirely awarded to him. There was another sort of match, not before described, called the *akrocheirismos*, which was a wrestling at arms' length. The whole thing was a trial of strength of the fingers ; and when one could manage so to grasp his adversary's fingers, and to squeeze them that he could endure it no longer, the day was gained. It was a trial which could hold out the longest. It was much used by military men of the time, rendering them more active in the use of their arms. Another kind of exercise was running a given distance forward and backward without turning round at all ; and a very servicable one follows this, though some writers confound them together as one and the same. It was one in which the players were wont to stand before a wall, so that if they lost their balance at any time they were readily saved by clutching the wall, and in this position they stood upon tiptoe, raising their hands on high and moving them backwards and forwards. It is a very excellent though difficult exercise. Milo, it is said, could hold a pomegranate so firmly in his hand, that no one, save a lady to whom he was ardently attached, could get it from his grasp. Another was where two persons grasped each other round the waist, their fingers joining the hands like two combs with their spikes between each other, and the struggle was which should free himself soonest from the embrace of the other. There were many others which Avicenna tells of, yet they were less separate exercises than displays of the strength of combatants. In the palaestra was played another game, called the *dielcystinda*, chiefly by boys. In this there were two sides, and a line drawn between, the victory being to those who drew over the others to their side. To free persons from torpor of mind, as

it was supposed,—and certainly, after literary labour, it is very refreshing,—a sort of flinging about or gesticulating with the arms was in vogue. Another practice was of this kind : Suppose one person attempted to flex the body of another, who, not only with his hands but with his feet fixed, strongly resisted the inflexion, he would be exercising in a similar manner to that which Milo taught, as mentioned in a previous page. Many of these were used for diminishing polysareha, or superabundance of flesh, as well as to remove the after-effects of gout, either in the hands or feet.

We next arrive at a most singular method of exercise adopted by the ancients, namely, the *holding of the breath*, as it was called. It is mentioned, and we believe approved, by Galen ; and thus it was that the two processes involved in breathing—the *inspiration* and *expiration*—furnished the means of performing this exercise. The old notion was that *inspiration* was the process by which the air, to temper the heat of the heart and generate the spirit, is drawn into the cavity of the chest. *Expiration*, on the other hand, was said to take place when the blackness, or soot, generated in the heart is thus led out through the cavity of the chest itself. These views, erroneous as they now are known to be, have yet their peculiar interest, inasmuch as they were the parent sources of the persecution to which the immortal Harvey was subjected ! Thus it was that when the respiration was hindered in any way, neither of these processes could be performed except with considerable effort. Under the direction of the gymnasts there were two holdings of the breath in use : one, in which they stretched the whole of the muscles of the chest and relaxed those of the diaphragm, so as the more easily to press downwards upon the abdominal viscera ; the other, in which the abdominal muscles were stretched, by means of which the parts of the body below the

diaphragm were chiefly affected. In both instances bandages were used, encompassing the thorax, ribs, and abdomen, by means of which they more completely effected their purpose. There is no doubt this affected the arterial circulation very considerably. Indeed, the ancients evidently discovered the latter, though they erred in their explanation of it, believing that the arteries conveyed air instead of blood. From their explanation it is clear they observed its effect also upon the venous stream. We are told, as an example, that Aristophanes, at one of Plato's banquets, was cured of hiccough by holding the breath. To ensure its better success, the following rule was observed. First, the exercisers were ordered with inflated cheeks to breathe lightly and briefly, then strongly and for a longer time, and then to relax altogether. For it was one of the excellent precepts of Hippocrates that "all things should be done gradually." With the *athletæ* this was chiefly used for refreshing them during severe exercise, and at the same time making the body better conditioned for subsequent labour. Galen also seems to signify that this holding of the breath accumulated strength for impulsions, compressions, or struggles, jumpings, and the like, as, indeed, we all find to be the case. For that greater strength is somehow produced if the breath be held, those who carry burdens daily show, and also others engaged in more laborious occupations resort to it to render their efforts more efficacious. Aristotle supposed that the retained breath filled the vessels, though he thought the strength came from its not allowing the humours and spirits to pass out of the body. The *aliptæ*, whilst rubbing the *athletæ*, were wont to order the latter to interrupt their breathing, and thus offer opposition to the rubbings, so that in this way the parts of the body which were anointed and manipulated seemed to be distended. Thus it was used in a medical

sense in gymnastics, and was made use of by the *athletæ* sometimes for the sake of ostentation. We read of Milo binding his head with strong fillets, also his ribs and chest, and holding his breath till these bindings burst asunder by the force of the swelled vessels. Milo, it may be here mentioned, was one of the most celebrated of the *athletæ*, who, by accustoming himself from early years to bear heavy burdens, obtained prodigious strength. He was seven times crowned at the Olympic games, and enjoyed the friendship of some of the most distinguished men of his time.

The following figures, which more readily explain this, were copied from brasses in the possession of the Prince of Ferrara, about the middle of the sixteenth century. In the engraving may be seen the rollers for the chest and ribs, as mentioned by Galen, and the abdominal region greatly inflated as is wont to take place when the breath is forcibly detained.

But the reason for these figures appearing with shaven heads, with hair alone upon the very summit, and carrying plummets or dumb-bells hanging from the left arm, is, we think, both because they were slaves, and because they were skilled in using the dumb-bells. For we read that many nations shaved the heads of their slaves; just as they shaved the entire heads of the *Dacæ*, a German nation conquered by Trajan, except so much as could cover the crown.

Hippocrates considered that it opened out the channels of the breathing, acting also in some way upon the skin so as to extrude its moisture. Galen declared that, amongst other effects, it "opened out the internal cavities." The operation was thought to be like that of the artificer who helps to purge his instrument by blowing through the lower hole of it. The most reasonable explanation of it would however be that, supposing the lungs distended with air after a deep inspiration,

and the epiglottis closed, the air-cells of the lungs are more perfectly distended throughout, and the force of expiration subsequently rendered more perfect than in ordinary breathing. The explanation given in the sources whence we derive all our information seems to depend entirely on the antiquated notion



that by this pressure of the muscles *air* was conveyed to every part of the frame, and therefore we need not enter upon its discussion. It was considered an excellent means of removing abdominal flatus. It was also used to suppress coughing. Thus it was recommended to all those who had weak lungs,

and suffered also from constipation and flatulent distension. It was evidently copied from the yawnings and stretchings which produce much the same effects on the body; just as Hippocrates correctly observed, that a long respiration was the remedy for frequent yawning. Ætius recommended it in every sort of weakness of the vocal organs. That the expelling force is increased by this retention of breathing, is seen in the effects of crying, laughing, and the like in many persons, especially very young children. In obstetrics its effect was well known then as now, that the birth is accelerated by holding the breath.

Yet Ætius very properly warns us that we may run into great errors in this respect, for by too much retention of breathing aneurisms and incurable dilatations of the arteries of the throat might occur, as well as the globe of the eye become affected. Aristotle recommends it to improve the hearing, because respiration causes a noise in the ears. This is merely when it is desirable the hearing should be unusually acute to passing sounds. It was thought too that, when a person either fell down or anything fell upon him, the effect of either was considerably lessened if he resorted to the safeguard of holding the breath. Another writer, C. Aurelianus, has very carefully considered it as assisting in the cure of *asthma*, debility of stomach, and colic. In epilepsy, and affections of the head generally, its use was avoided. Again, in spitting of blood from the lungs, in hernias, and any chronic inflammation of the bowels or peritoneum, lest the muscles should be brought powerfully into action, it was disallowed. For, as in children, serotal hernia is at least increased during crying, so trumpeters and singers were said to receive damage from it. Yet one rule may serve to obviate the perils of this kind of exercise, and it is that whenever it be done it should be with moderate

retention, or one rather below the average, at least to begin with.

To prevent, or, even if it be possible, to check the progress of phthisis, graduated efforts of inspiration and expiration, but especially the former, together with muscular movements to expand and increase the diameter of the chest, should be early resorted to. The very form of the chest, and the deficiency of healthy aëration in one or both of the upper lobes of the lungs, point to the nature of the methods which are likely, combined with other aids, to be of service to the patient. We believe that, as noticed elsewhere as the main cause of coagulation of the blood, there is obstruction caused by the first tubercles, leading on to more general and diffused depositions in the structure of the lungs. Here inactivity prevails in the first instance, and the earlier the necessary development of the chest is sought for, the less likely will it be for the disease to lay its slow and insidious foundations.

In addition to this exercise of the breathing it may be well to mention another which was intimately connected with it by the ancients, we allude to *vociferating* or *shouting*. The two functions of inspiration and expiration, and consequently the movements of the lungs, are equally concerned in this. Galen, however, tells us little about this exercise; but others have dwelt upon it with great care, considering that it was very highly esteemed in those days, not only in the cure of various diseases, but in the training of the voice itself. With respect to the latter, all the professors of the histrionic art, under which title we include heralds, choristers, reciters of tragedies and other plays, as well as those who held contests with their voices, were wont to be exercised in vociferating. Not only such, we are told, but even the very laws, were in those times often chanted forth in song! This exercise of the voice was there-

fore of such importance that public contests in vociferating, as before mentioned, were instituted, so as to decide who was best at the processes of measure and time, and rewards given to such as excelled. When Galen came upon the scene he found the physicians had already prescribed certain medicaments to be used both before and during the contests; and he narrates how the teachers of elocution in his time, the harpers, the criers, also the performers in tragedy and comedy, who used their voices much, when they injured them in contending or otherwise, were accustomed to resort to much bathing, together with light and wholesome food. Nothing could be more prudent than for the professors of the histrionic art so to exercise and prepare their compass of voice as to meet all the demands of recitation, whether of dramas, rhapsodies, and other imitations requiring loudness of voice, uniformity of tone, and sometimes great variety and change. And Aristotle informs us that it was done in old times in tragedy to increase the greatness of the effects of sorrow and calamity.

The teachers of these practices with the voice were called *phonasi*, and the art itself *phonasium*. Respecting the place used for such purposes, we learn that the Greeks as well as the Romans had a sort of theatre constructed into which they brought a poem before it was acted in the regular theatre, and where they also witnessed trials of musical skill, which place was called by the former *odeion*, and by the latter *odeum* (a music-room). Here it was, we think, that the exercises of the voice, and the contests before spoken of, were wont to be carried out. Nero seems to have been a great patron of musical contests, having built an odeum, where, besides harpers, dancers to the harp and singers to the harp practised or contested. But we surmise that the ancients contended with the voice, and exercised themselves in other places also, and especially in the

halls of the gymnasia, in which we are told that philosophers and rhetoricians used to dispute. For forming the voice also some used to vociferate, read, or sing aloud in hollow places, others near the seashore,—the latter being a practice of Demosthenes. In Plutarch's account we are told that Demosthenes hesitated in his speech by reason of weakness of breath, and that he paid 10,000 drachmæ to the actor Neoptolemus to teach him to recite passages of verse in one breath.

Among other exercises for a weak stomach, Celsus has ordered the *clara lectio*, or reading aloud. The voice-exercise was more properly called declamation, and C. Aurelianus advised, in cases of loss of voice and other affections of the same kind, that it should be resorted to under the care of a master; so that, in that age, it had a medical use, and the teachers of gymnastics had a knowledge of the methods, times, and rules of such voice-exercise. From its extensive use subsequently this exercise proved to be most efficacious, not only in the preservation of the voice and cure of some affections of those parts, but in conducing to health and rendering the body strong. It affords capital exercise to the thorax and muscular structure of the vocal chords; improving also the condition of the lungs; and the wonder is it is so much neglected at the present day. Were it more attended to, we should rarely hear of *pneumonia* following any undue or prolonged exercise of the voice, as it often does in delicate-chested or scrofulous individuals. And Galen even tells us of a celebrated Thessalian in the age of Nero, who styled himself a physician-conqueror, affirming that he could even cure malignant ulcers by voice-exercise. If he improved by its means the vital powers of his patients, he would no doubt improve the condition of the ulcers.

A description of the manner in which it was done is given

by C. Aurelianus. He says, that the beginning was executed in gentle tones, but the narrative and demonstrations in a prolonged and louder voice, and then the epilogue in a soft and smooth tone. Antyllus' description is, that when the bowels had been emptied, the singers were at first gently rubbed, and were well wetted or washed with a sponge, especially the lower parts and the face; then they began to use the voice, gradually at first, and at moderate intervals, but sometimes they walked about previous to so doing. Then they began to use the voice as formerly, and those who were educated uttered those things which they remembered, or which seemed to be 'plain, and to have many changes of roughness or smoothness. If they were acquainted with poetry, they recited iambics. The third place was given to elegiac verse; the fourth, to melody and harmony; and in all these it was judged better to recite than to read, and to use moderate tones than such as were too loud and clamorous. They were also exercised in producing as deep tones as possible, going from these up to the highest. Then, when they had gone nearly as far up the scale as they could, they came down again gradually, till the tones were as deep as those with which they began. In this way the whole exercise was performed, attention being paid to their strength, quickness, manner, and to other matters which Plutarch has more amply touched upon.

Moreover, many of these things were performed while lying, sitting, or standing; and for this reason some judged that large-sized places were quite unnecessary for this description of exercise. Pliny mentions that the Emperor Nero had pointed out a way of strengthening the voice, namely, by placing a plate of some material upon the chest, and then reciting verses.

Since we have declared that in this kind of exercise harmony and measure held the fourth place, some one may naturally

ask, what are our reasons for believing that to be the case, as Plato, in numerous places in his works, has considered music and gymnastics entirely different, nay, almost contrary to each other: the one concerning the mind, and the other the body. To such an one, we think, this answer should be given: that music is altogether separate from gymnastics, in so far as it is composed of rhythm, melody, and harmony; because in this point of view it endeavours to solace and please the mind, and is in some way suitable for softening the manners of the human race. But in so far as it makes use of the voice, and has to do with sounds,—sometimes deep, sometimes sharp, sometimes moderate in pitch, which sounds are not produced without some bodily labour,—it is clear that it holds a place in the gymnastic art. All music is made up of determinate movements of the voice, which movements both increase and preserve the natural powers and strength; so for this reason we may take it as an exercise equally with the vociferation and declamation; for the ancients recommended its use under a singing-master for loss of voice. Sometimes declamation was gone through in the presence of a teacher, the order of time being well preserved; sometimes, the same thing under the direction of an alipta, or that of a professor of music. Sighing also was deemed an exercise, because the athletæ at times used it, gaining relief to their exertions from it; and Aristotle very properly draws attention to the advantage very young children gain from crying, in which they are, he says, on no account to be checked. The same, or nearly the same, effect is produced by boisterous laughter.

But to give a fuller notice of this, according to ancient usage, we may mention that it had six divisions, namely, *vociferating, singing, reading, talking, laughing, and weeping*. The first chiefly exercised the chest and vocal organs; indeed,

it was the opinion of their physicians that the proper exercise of the lungs was by using the voice. It was seen to heighten the colour, and clear the larynx and chest. It was commended by several old authorities in debility of stomach, vomiting, and acid eructations, loathing of food, and symptoms of atrophy ; for the languid, cachectic, dropsical, and asthmatical ; in orthopnoea, in phthisis, or when troubled with long-continued pain of the chest or diaphragm ; in quartan ague, pituitary catarrh, and persons recovering from illness ! Galen recommends, in pain and distress of stomach, inunctions, exercise, and vociferation, to be exhibited with great expertness. It was the opinion of Aretæus, an ancient and distinguished physician, whose writings are used in the medical schools of the present day, that it was useful in elephantiasis, and obstipation of the bowels also. Also in cases where the voice became hoarse through atmospheric moisture it assisted in relieving the latter. Hippocrates declared in favour of this exercise after supper. It should, however, be practised very carefully, beginning very gradually. If not, it produced throbbing of the temples, pulsations felt in the brain, fulness of the eyes, and singing in the ears ; but the voice moderately used profits the head. They thought it in some respects dangerous after food ; and actors and others were advised to exercise their voices with empty stomachs ; but this we believe altogether wrong, and that the stomach or system should have been moderately supplied with food previously. *Singing*, which followed next in order, is a far more pleasant and safe way of exercising the voice. In all time it has been found to relieve any mental or physical weight the body may have to bear. With reference to the modern serpent-charming in India, it is curious to note that in those remote times the modulations of a pipe and singing were said to cure the bites of vipers. Singing with gentle and

soft notes was also said to affect the malady ealled *sciatica*. It was sought as an aid also in frenzy, though one author ridicules Aselepiades, who professed to cure frenzy by singing; saying, appositely enough, that the minds of those are cast in vanity who profess to be able to shut up the force of a passion by notes and a song. Children should, however, be allowed to vociferate as much as they please, in convenient seasons and places. Time, in the case of adults, should be taken to produce a strong voice.

Other similar effects are often produced by reading, conversing, laughing, and even weeping. The reading aloud was considered serviceable to clear the head, and was useful even to the insane. If, however, there were any discharges from the head, it was considered as hurtful as immoderate gestations would be to the body. Reading aloud helped the chest and stomach. Pliny the elder, who suffered both from his stomach and breathing, exercised himself with reading aloud by way of remedy. Those who were subject to colicky pains were advised to exclaim gently and advance gradually to vociferation. Some such method we learn was adopted with consumptive persons, in whose case the reading was to be commenced lightly, thence the voice to be methodically raised; and after the voice had been made stronger, the sound was to be increased and kept up longer, the time of it being regulated so that it may afford greater assistance. Celsus thought that the intense and more vehement manner of reading was in no slight degree useful to persons labouring under a dry cough; whilst that which is performed more lightly and remittingly is in the same measure a healthy process to almost all individuals. We can also use it after food without harm; indeed it is very distressing to some to read aloud on an empty stomach.

Next to *singing* we may notice the *oration*, though not an exercise of the voice demanding so much exertion as the foregoing. Indeed, it was reckoned among weak exercises. It was recommended to persons who had a propensity for sleeping. Many parts of the body obtain benefit from it, whilst the salivary and other adjacent glands are put into active operation. But it is to be carefully guarded against in affections of the head, weakness of sight, or bleeding from the lungs. In the latter case, silence is to be observed. For three years, we are told, that one individual in those times imposed silence on himself, to escape an eruption of blood. We need say little of *laughter* or *crying* as exercises, though their effects are peculiar. There is no doubt the former assists digestion, as the court "fool" (who, by-the-by, was generally no fool) afforded undoubted evidence of it. With some it produced a good deal of heating of the face and undue excitement, being the *strong laughter* of Plato, though the Greeks deprecated this in a celebrated line, which means that

Among mortals excessive laughter is a grave fault.

It was then, as now, very fatiguing also; for one Procos was considered to have died of laughing. Aristotle lauded the crying of boys, saying that it made them more agile and robust, for they cry from their very birth. The infant's wants are made known by crying. With the adult it is a mysterious emotional process, evidently affording relief to the heart or vessels of the brain, or both unitedly, and thus preserving the nervous system either from the effects of a severe shock—than which nothing is more deadly—or from those of local determination of blood.

CHAPTER VIII.

Horse Exercise and its Uses—Passive Exercise and Gestations in Chariots and other Vehicles—Litters and Pensile Beds, their Utility and Application—Swimming and Hunting.

HITHERTO we have been treating of exercises which men took of themselves, and without the aid of any sort of assistants. We now come to speak of one in which men moved, to a certain extent, spontaneously and freely, but yet not entirely so. This was called *equitation*, or *riding on horseback*; and in all that appears from ancient works on this head, the reader must distinctly understand that *riding*, with the ancients, was a very rough process compared with that of the present day. It was called by the Greek physicians *ippasia*; and was said, very properly, to partake of the nature of two kinds of exercise—an active and a passive; one partly done by ourselves, and partly done for us. Bellerophon was the assumed inventor of riding, and, after him, came the Thessalians, who acquired the fabulous character of Centaurs from this circumstance, riding to war on horseback, and being followed in this mode of attack by the Seythians and other nations. The idea of a man on horseback being looked upon as a Centaur is not an unlikely thing among a semi-barbarous people, for we recollect the fact that the astonished natives of Australia, when they first beheld a man on horseback, believed both horse and man to be but parts of one and the same strange animal. We read of several

effects produced by excessive riding on horseback, the most important of which was impotency, also pains in the hips of a severe kind, said to have been cured by incisions behind the ears. The former, however, was, when some ascribed it to the hands of the gods against the rich, disproved by Hippocrates, on the ground that the rich were always befriended by the gods, but the poor very rarely. And for this reason it appeared right that the poor, rather than the rich, should be troubled with this complaint ; yet the very contrary happened.

After the time of Hippocrates, riding was held in the highest estimation. In the circuses and games it was introduced, mention being made of a contest with horses in the 25th Olympiad. The same fact is also proved by the existence of the *four* Roman parties of charioteers, called the *white*, the *red*, the *blue*, and the *green*, which always contended in the circuses, games, and other equestrian contests, the horses being used both in riding and driving. So much care was exhibited in choosing or procuring the best horses that, as Galen relates, many marvellous means were used by which the habits and temperaments of these animals could be ascertained. Nor were the owners, to secure the victory, inclined to spare any cost, labour, or study ; the more so, as the whole city was, as it were, divided into four parts, one favouring one faction, and one another ; nor was there any part of the city to be found, or any assemblages of men, in which, at the periods of these contests, their merits and prospects were not most carefully debated ; or at least it was one of the most absorbing topics.

*De prasino conviva meus, venetoque loquatur ;
Nec facient quemquam pocula nostra reum.*

Still, some are of opinion that the very bitter contentions among the diverse parties arose from the circumstance that the

garments of the Romans were worn of four colours only, namely, red, white, blue, or a brownish-red, the latter, according to Martial, being the most prevalent:—

In *brown* they dress at Rome,—in *red* in Gaul,
Which colour pleases boys and soldiers all ;

and on that account every one was supposed or obliged to favour that company which showed a similar colour to his own.

As a warlike exercise it was by the ancients carried to great perfection, the soldiers being prepared for battle in various cavalry manœuvres. It was recommended that men should be so exercised with or without weapons, and not only men, but the same kind of exercise was allowed to girls. A sort of cross-country riding was suggested for health, neither avoiding plain surfaces, steep descents, ditches, nor mire. Galen considered it to be an exercise that ought to hold a high place, inasmuch as it not only exercised the body, but also the senses. The nephew of the Emperor Tiberius, whose outward appearance was said to have been spoiled by the thinness of his legs, was cured of this defect through riding by order of his physicians. The latter, it may be mentioned, established great differences, whether men rode on mules or horses, and whether they were ambling animals or cantering ones, or jolters, or chargers.

As Galen at times enumerated equitations among those things which he styled *exercises* or *employments*, they appear clearly to have been in his opinion strong exercises. A horse or a mule, by its moving along slowly or rapidly, ambling or running, made a great difference in this respect. *Ætius* and another speak of the calm and quiet riding. If a horse moved along placidly, no greater effect was produced than that of lassitude, and especially of the loins. *Hippocrates* alluded to

both forms, contending that persons were often rendered unfruitful by too continuous riding, and approving of the milder qualities of the gentle riding. We must here repeat that the ancient riding was very rough cavalry riding, and no doubt considerable injuries were caused by the more violent forms of it. It was recommended in pain of the head, being useful to strengthen both the head and stomach; and, again, in that condition of epilepsy which is induced by cold. Regarding the latter, we may remark that here is a proof how ancient was the so-called modern notion with some, of one of the proximate causes of the epileptic seizure being *cold*. It was on the same ground, we suppose, said to be useful in deafness. It was used by Ætius in curing hiccough; and was doubtless applied in cases lasting for several months, similar to such as are of more modern record, which have been cured by frights, nervous shocks, and the like. Riding undoubtedly "purges the senses," as the ancients conceived; and it was thought highly of even in dropsy, whilst it improved the tone and action of the bowels. Yet the chief physician of the Emperor Hadrian condemned it as injurious to the chest, and in affections of the bladder, though we are not told why it is here to be specially avoided. Themison, the reputed founder of the sect of physicians called the "Methodists," ordered those afflicted with *sciatica* to ride, in order to create a strong action in the parts near the seat of pain. This we have never tried; but we know that passive, and even active, movements of the muscles of the limb are highly serviceable in *sciatica*, and in preventing the too frequent lameness resulting from it. It would not have done on a "hard-trotting horse," which was condemned even for the *gouty*. The Italians were right in describing a "hard-trotting horse" as an open sepulchre,—

Succussatoris tetri, tardique caballi.

The latter was, however, the form which most completely agitated the frame and the entire viscera, and was thought, with fair show of reason, to assist the various secretions and excretions forming in the body, and was useful also in discharging gravel and calculi from the kidney. Yet after all great care should be exercised in these respects; and all parts of the body are better influenced and less damaged by gentle riding, whilst ambling was then, as now, a great favourite. Hippocrates considered that hard galloping heated, dried, and attenuated the body, diminishing the flesh, badly affecting the head and eyes, and weakening the senses. It was said that many suffered from this violent exercise in kidney affection, *ardor urinæ*, stone, and inflammation of the bladder or peritoneum. The fractures, dislocations, and the like, were of course as frequent and numerous, or more so, than those of our own hunting days. On the whole, it is, judiciously managed with regard to individual powers and capabilities, one of the most serviceable of exercises both for body and mind.

Another form, corresponding with that in which the object is attained without any exertion on the part of the individual who exercises, was that of riding in chariots or other vehicles. This form of movement is more properly placed under the common appellation of *gestation*, and we have this on the authority of many writers—Galen among the rest. Galen has distinctly characterised riding as a mixed motion; and riding in a carriage of the present day can only be esteemed *passive* exercise; but riding on horseback is both *active* and *passive*, and properly the *mixed motion* of Galen.

The use of chariots is to be traced to very remote periods in the history of the human race. So great an invention was it esteemed among the early Greeks, that they created the reputed inventor, Erichthon, after his decease, a constellation in the

heavens, under the name of Boötes. Many different forms existed, and Pliny mentions the proper kind of planks to be used as materials for constructing these chariots; whilst the oak, ash, and elm were especially to be used for the axles of the wheels. At first they were constructed on two wheels, and afterwards on four. Subsequent to this, the Scythians are said to have constructed a chariot with six wheels. The wheels of these were ornamented with tin, and the whole vehicle was adorned with ivory. In the time of Pliny, both the chariot-wheels and the vehicle itself were conspicuously decorated with gold and silver. They were covered also with skins, and were drawn either by horses or mules, and at times by both. Helio-gabalus not only joined various and monstrous animals, but naked women, to his chariot.

This gestation in chariots was considered a great luxury by the women of ancient Rome, and at times it was carried to so extravagant a pitch, that they were forbidden by a decree of the Senate. The sex, however, was not to be put down in this way, for it speedily set up such an amount of plotting against the men, as to get the decree annulled, and once more permission given to use these chariots. The latter we have on the authority of Plutarch. But Antoninus, wishing to guard the natural modesty of these females, prohibited their being seated or carried by horses through the city.

The contests of the chariots at the Olympic games are well known; sometimes with two, sometimes with four horses. The expert training requisite in the management of the chariot had other objects beyond mere pleasure, that of rendering them serviceable in war; and that they were so, the Sacred Volume abundantly informs us. With the Romans especially they were used in the cure of sick persons. In regard to the latter, Galen mentions two sorts; one, in which

men sat as they were carried, the other in which they lay down ; and each of these was rarely performed in the city, but most frequently in the public highways and without the city. The Romans prohibited its use during the festival of the Seven Hills, saying that "a chariot ought not to be used on that day," and men should not leave the city and the celebration of the festival. In no case, likewise, did the healthy and sick exercise in the same vehicles ; and it would be well if this precaution were better attended to in the present day. Those persons who suffered from fevers were exercised in vehicles borne by the hand ; they were also accustomed to be gestated in two-horse chariots, and at the commencement to be moved thirty stadia, then double the distance ; and those beginning with thirty or forty stadia were so much the better enabled to progress another space. But it is very likely that the wealthy in all cases used covered or open chariots without any discrimination ; the chief, probably, were rather covered than uncovered. Claudius Cæsar was declared to have been thus brought into excellent health, having suffered from a condition of partial paralysis of the muscles of the head, tongue, and hands, and that he was the first among the Romans who was carried in a covered vehicle. When Pliny suffered from some affection of the eyes, he described himself as being shut up in a closed vehicle, as if he lay in a bedchamber. There existed, no doubt, distinct rules to guide the charioteer, when the sick or convalescent were being exercised in this way. Many of the ancients possessed chariots or vehicles of various construction, all of which were alike, inasmuch as they moved with wheels, but differed only in form, material, and magnitude from each other.

The following appear to have been among the most important of these vehicles ; namely, the *plaustrum*, a cart with

two wheels; the *essedæ*, a two-wheeled war-chariot; the *petorritum*, an open four-wheeled carriage: the *carruca*, a species of four-wheeled carriage used in travelling; the *carpentum*, in some cases a cart, in others a two-wheeled covered carriage; and it was an especial honour for Roman ladies to be seated in it when visiting the public or religious festivals; the *thensæ* were carriages something like the last, except that they were used to convey the statues of certain deities only to and from their shrines in the processions during the sacred festivals; the *cisium* was a light open vehicle, something like the gig of the present day, save that it had no springs, and was let out for hire along the public roads; the *covinus* was a travelling carriage, covered on all sides except the front; the *rheda* was a very large travelling chariot, capable of containing not only several persons, but baggage also; it was supported on four wheels; the *pilentum* was something like the *carpentum*, though on four wheels, but used for the same purposes, and comfortably furnished with soft cushions,—open at both sides, so that those within it could both see and be seen. The foregoing vehicles were, with the exception of the *essedæ*, peculiar to the Roman people.

There was a distinct difference between riding on horseback and the chariot exercise recognised by the ancients, much on the same ground as we have already laid down. In the latter there is at once a mixture of motion and repose, many parts of the body not appearing to move, though the whole is borne along; whilst in the former there can scarcely be said to be any degree of repose. Gestations, therefore, among the best authorities, *Ætius* among the number, are to be placed among the calm and weak exercises, not only applicable to the healthy as well as the sick, but to long and exhausting diseases, and, in fine, are accommodated to those in whom certain relics of

disease still remain. They were approved even in some acute affections, as by Aretæus in *lethargy* and *nephritis*. Celsus also mentions that Asclepiades approved the use of gestations in recent strong fever, chiefly for the purpose of the concussion it produced. For gestation with the sick, whilst it did not fatigue, moved them in the same way as great exercises; producing those augmentations of function which exercises in general do. It was deemed most useful after night watching, or night study. To guard against danger in using it in disease, Celsus ordered these rules to be observed; namely, that there should be no foulness of tongue, tumour, hardness nor pain in the viscera, head, or præcordia; and, on the whole, no distress of body produced by it, in whole or part, unless the nerves alone are painful; and never to be used in the outset but in the remission of fevers. Gestations were said to be approved by many authors in various affections. Aurelianus prescribes them in long-standing diseases. He commends them in the sitting position in *loss of voice* and *hæmoptysis* (though Asclepiades condemned the same), in *asthma*, *stomatitis*, *elephantiasis*, *colic*, and *gout*. Aretæus wished to use gestations in *melancholia*, *atrophy*, *splenitis*, and *gastralgia*. Galen speaks of them chiefly for refreshing the body. Celsus praised them in *erysipelas*. They were directed to be taken in certain places also; for Aretæus, while demonstrating various open-air exercises, has placed above the rest that which was effected among laurels, myrtles, and thyme.

We next come to the mode of gestation in *litters*, or *chairs*. There are not wanting many who think that these were rather for the accommodation of those who, either through age or the impediments of disease, were not able to walk, or purely for luxury. Nor was this perhaps unreasonable, since it was necessary the ancients should devise means by which, when

unable to go either on horseback or foot, they could leave their houses and traverse the city, making the journey as comfortably as possible.

The emperors, kings, and chief men invented litters and chairs, so adapted as to be covered or laid open, lest in making their journeys they should be hurt by the sun, wind, rain, tempests, and so forth; after these, other rich persons used them for luxury or advantage; and, lastly, the physicians made use of them for those persons who were entrusted to their care. Walking exercise was, however, always preferred wherever it could possibly be taken. For, respecting the latter, delicate habits too often bring on such an amount of weakness, that after being a long time without the *will* they cease to have the *power* also. The latter was very justly remarked by Seneca of himself, and it will apply to people in every age of the world.

In the litter there seems to have been a pillow and little bed, like the modern palanquin, and so constructed that persons could either lie down or sit in it, just as they pleased. They were often carried by six servants, and on account of this were called *hexaphori*, as may be seen in these verses of Martial, in which he derides the poor and youthful Afar, regarding the manner in which his litter was borne:—

“ When poorer yet than Irus thou art deemed,
 Than younger Parthenopæus esteemed,
 Stronger than wrestlers in their pride and might,
 Why to be borne by six dost thou delight?
 ’Twere a less jest shouldst thou in public go
 Naked, afoot, amidst the pageant show;
 The state thou tak’st does more absurd appear
 Than if six slaves a seventh in pomp should bear.
 A Moor upon an elephant of like hue
 Would move less laughter ’mong the vulgar crew;

Or on a mule, as little as himself,
 Mounted we see some pigmy little elf.
 Wouldst know what scorn thy pride to thee hast bred?
 Men grudge that six should bear thee we'rt thou dead!"

In the same way he finds fault with Zoilus for having a litter like a coffin, or bier for the dead,—

"Let thy litter be larger than e'er moved on six,
 'Tis a bier if upon it thy carcase they fix."

From all this we may clearly understand that the litter was carried almost always by six servants. Germans were said to have been chiefly employed in this work. If any one chose to increase the number of his litter-men, notice was immediately taken of it; as the same poet calls one Phillip a madman, because, for the sake of showing off his wealth, he caused his litter to be borne through the city by *eight* bearers:—

"Phillip in health eight men to bear him had:
 Who thinks this healthy must himself be mad."

Since this was the state of things with regard to the litter, it served not only for a seat, but, when shut up, to induce sleep. A litter with a closed window was also said to induce sleep. So frequently were they used, that there were held in many places camps of litter-bearers, who were daily employed by the matrons and others in much the same way as the "cabs" of the present day. Mention is made in the works of the old Roman jurists of such camps, and of the laws pertaining to them, and indeed of all other matters which were wont to be transacted in connection with them. In many respects it would appear that these litters were chiefly confined to the use of women, invalids, and persons of rank, and that men generally were not allowed to use them, or there was a special privilege attached to their use.

The *sella*, or *sedan*, was of two kinds; one, in which people sat, and which might be either covered or left open, called *portatoria*, or *gestatoria*, *sella* and *sertorium*; another, in which the occupant reclined at full length. The *portatoria sella* was very recently in use in our own age. Gouty people, rich men, and other grandees, too much given to luxury, were those who daily made use of this kind of conveyance. Hence, we think, arose the title of "chair of state," used as it was for sitting only.

Of the second kind, or full-length litter, we have not much knowledge. The latter was doubtless most frequently used by physicians for the sick. Galen says that Antiochus, a physician of eighty, and who was very skilful in matters of living, if he wished to go to a distance was wont to be borne, now by a chair, now by a chariot. Another writer mentions that an uncle of his, in Rome, was accustomed to be borne in a chair, so that no stress of weather might keep him from any pursuit in which he was engaged. Whence it may be judged that the old men, in exercising themselves, and in going out on private business, were carried in chairs, just as the physicians ordered those who laboured under extreme debility. In the latter case they were not carried at the same time less than *five stadia*, nor more than *ten*, and the same order was observed on the following day. But on the third day *five stadia* were added, and the same number each succeeding day till the journey reached *thirty stadia*. The chair and litter were therefore scarcely identical. Some of them were constructed of leather, others inlaid with bone or ivory, and some of silver.

In the general qualities and uses of these gestations, for the sick especially, we find that they were invariably moved very cautiously and gently. The luxury of ancient Rome far surpasses our present notions of a litter or chair, when they were often constructed of gold as well as of silver. The vehicles chiefly

ordered by physicians for the use of the healthy as well as the sick were drawn by animals, either mules or horses ; others by men, either slowly or rapidly. Celsus considered that gestation was conducted more briskly than otherwise by a vehicle ; yet, according to the opinion of Galen, it should be placed under the head of weak exercises. It may, however, be of all others the least useful to the healthy, unless they are prevented taking other exercise, being, indeed, more suitable to the sick and aged. One author thinks that, to remove obstinate and chronic diseases, bodies must be relaxed by the force of gestation performed in vehicles. When performed gently it seemed to relieve any congestion of the liver and improve the breathing. The milder form was recommended by some in head affections and *dysentery*. Gestation was recommended by them even in madness, and in the cure of paralysis, but not in the cure of epilepsy, for which it was disapproved, on account of the vertigo and sickness the motion of a chariot creates in some people. By some seeming incongruity, Ætius is said to have ordered those subject to the latter to sit backward in a chariot, and speaks of many cures effected by it. Celsus has also recommended the milder form in dysentery, and we have heard of several cases in our own day of chronic *dysentery* being improved immediately on the sufferer moving at a slow pace on horseback, whilst a cure has resulted from the adoption of this method. In another instance a chariot with post-horses is advised for such, as being a species of vehicle journeying slowly, and avoiding the rapidity of the chariot, the waggons, and the swift movements of their horses. The vehicle here alluded to was doubtless a *cisium*, a species of gig drawn by mules, which were kept at various stations along the roads for hire. They travelled at the rate of five miles in the hour. Ætius thought there was a certain force brought into action by

these means, so that it diminished superabundance of flesh; and it was deemed the best security on this account against affections of the chest and stomach, in large tumours, in dropsy, and persons struck down in a condition of stupor. This, whatever amount of truth or otherwise there may be in it, is far removed from the question whether healthy men should use such a vehicle, and it is decided that they should seek in preference the greater and more useful exercises. But by healthy men it was more consistently used after food, and for going about their necessary business. In this way the Emperor Augustus is spoken of as having been received into his litter after supper by lamp-light.

In exercising sick persons in this way there appears to have been a double use arising out of the gestation sitting, or gestation lying down. They were gestated lying when suffering from the lethargy of fevers, the semi-tertian and quotidian, from dropsies, apoplectic seizures, debility, nephritic complaints, and gouty symptoms, in most of which cases the commotion or agitation produced by the litter brought forward the necessary excretions of the body. Thence it was that such gestation profited those who laboured a long time under weakness from taking hellebore; with the wakeful also, such as were oppressed with sloth and idleness, and those who in a manner possessed a craving appetite. According to the opinion of *Ætius*, those should be carried sitting in a litter who were in the complete decline of fevers, and for the same reason those who were not able to take other exercise, or who were labouring under some long-continued, though mild, disorder, and who, as they are weak, desire to regain strength; as well as those who digest their food slowly. *Celsus* prudently advises that when the *phthisical* are not able to sail on the water, their bodies should be moved on litters; and it was suggested

by another medical authority of that period, that the *dropsical* might be assisted by gestations performed by sailing and the aid of litters. It appears that the litter was capable of accommodating two persons; but it was not so with the chair. The litter also was carried by six or eight persons, and the chair by two. The healthy were carried in the chairs rather for pleasure and ostentation's sake than that of health; as Pliny we are told was, during his hours of relaxation, carried about Rome in one. Those recovering from *fevers* were carried lying down in the litters, and with great benefit; in some instances the litters were covered, and in others uncovered. The rule was, that so soon as a person was sufficiently recovered from a fever of long continuance he ought to be constantly gestated in this way: even in continued fever it was considered very suitable. In *phthisis*, however, the *hectic* fever was often increased by it. Whilst also we may exercise the sick with great advantage in the gestations of carriages and other vehicles, yet great care and study are required in their management, for sometimes in the incipient stage of a malady, sudden and dangerous symptoms may be set up, and these induced greatly by the motion imparted to the frame. These precautions are very necessary with those who are declining through age or infirmity, and with others, as in some conditions of *phthisis*, who instinctively prefer perfect repose of mind and body.

There were a variety of motions, partaking very much of the character of the foregoing gestations, which were obtained from *pensile beds*, or *cradles*. At the present day their use is confined to the latter, yet among the ancients they were apparently invented for the service of adults, in assuaging pain and inducing sleep. From the description given of the beds we judge that they moved much in the way of cradles, a small rope being often attached to one foot, so as to enable the bed to be

impelled to and fro. Not only were there pensile beds, but there were *pensile baths* also, and the chief supporter, if not inventor of these, was Asclepiades, who obtained immense reputation on account of them. They were considered not only useful but delightful. Those beds, which Pliny mentions were first thought of by Asclepiades, we take to have been small beds, constructed sometimes of wood, brass, or silver—for numbers of persons possessed silver beds in those days—which were fastened to the fretwork of the ceiling by ropes placed at their angles, and thus being raised ever so little from the ground they appeared to be suspended in the air. In a similar manner they arranged the *pensile baths*, which were not placed upon the roofs or arched places, as some suppose, but we believe were none other than baths, either of marble, brass, or wood, hanging from the fretwork of the ceiling in imitation of the little bed, and were very gently and lightly impelled to and fro by the hand. Seneca sneers at the practice, where he says, “a mode of suspension of baths has been discovered, that there should be nothing wanting in daintiness.” The effect of the beds is very obvious, while that of the baths was most agreeable, delight being experienced by the soft and gentle concussion of the water against every portion of the body. They remained for a considerable time in these baths.

There was another sort of couch, called the *skimpodion*, which was a kind of portable bed or hammoek, and in these sick and healthy persons were borne through the cities and through the country. Indeed it is said that the Emperor Severus, when he passed over to Britain, was borne everywhere in a covered skimpodion. It seems to have been very similar to a hammock, but to have contained a small feather bed. Galen suggested that persons in delicate health, and those inclined to hectic fever, should be carried in the skimpodion

to the bath. The skimpodion was a matter of luxury also, used indoors, and reminds one of the hammocks of the natives of the River Amazon, and other tropical regions of the present epoch.

It is evident that Asclepiades was the first who devised the pensile beds. He originated them for two reasons, one, that by gentle tossing or rocking sleep might be induced, the other to diminish certain symptoms of disease. On the latter account the ancients were led to their more frequent use in curing disease, whilst Celsus has judged that they should be administered where neither the ship, the litter, nor the chair were admissible, as in the case of a person recovering from apoplexy, all concussion being prevented by the gentle motion of the bed. In the opinions of other authors it in no respect failed to cure debilitating affections, for the infirm were always desired to exercise with the pensile beds. Still they were permitted comparatively to few, and considered more useful before than after taking food. In the first place, such gestation was deemed advantageous for persons in a state of fever, or prostrated by long-continued diseases, in which their wasted bodies were not able to sit upright, and also for those labouring under the effects of the fumes of hellebore. For those also who were recovering from febrile affections, in lethargy also and loss of appetite, it had been experimentally found useful: nor were those wanting who praised it in madness and in phthisis. Aëtius and another judged it should rightly be exhibited in *phrensy*, so as by its gentle movement to soothe the patient and induce sleep. The skimpodium doubtless originated in the pensile bed.

There appear to have been two sorts of bed of the pensile character: one which was impelled, as we have before shown, by means of a cord attached, and the other where the bed had

movable props placed at the corner feet. Still, both afforded the same description of exercise, because the latter is described as the rolling of the cradle, and, as such, has descended to our own times. By Galen it was placed among weak exercises, and was by him considered chiefly suited to the soothing of children, and scarcely fit for exercising either the healthy or infirm. Nevertheless, it was recommended for those who were debilitated by fevers, and especially those who were not able to move or sit up at all, as well as those who had been prostrated with a potion of hellebore. As the latter drug has so frequently occurred, we may mention that the juice of the plant itself (*Helleborus niger*) was esteemed by the ancients as a powerful remedy in cases of *mania*. To induce natural sleep, as well as relieve from torpor, or even insensibility, gestations were used in those days. There was another instrument, similar to a swing used by children and youths, by the gentle oscillations of which some sick persons were exercised.

Among the various species of gestations, there was a place made for sailing on the water, of which Celsus writes, making it the lightest of all other kinds; and its chief varieties consisted in whether the sick or others to be so exercised were carried over the sea, harbours, or rivers, in tranquil or disturbed waters. The navigation of the sea was ever the most highly esteemed, and especially with reference to the saline properties of its atmosphere. Voyages were deemed most serviceable, as they are now, in many cases of phthisis, hæmorrhage from the lungs, jaundice, coughs and colds, dropsy, and even in epilepsy when the patient was able to bear it. It was a celebrated remedy in *phthisis*. Pliny says that phthisical patients were wont to seek the shores of Egypt, and mentions several being restored to health by a residence there. Yet it is a curious circumstance, reminding us of the comparatively modern

fuss made about tar-water, that one old writer condemned sailing on the sea, or voyaging, in phthisis, but recommended that persons so afflicted should rather be brought to dwell in forests where pitch is made, than navigate the sea. There were differences of opinion, as we may partly judge from the ancient proverb, that "sailing is most agreeable near the land, and walking near the sea." The sickness induced was a point at which they aimed; just as Pliny declares that the vomitings induced by hard rolling about healed many diseases of the head, eyes, and chest. Yet gestation performed on the high seas is not only stronger than all the rest, but produced many and great changes, and was held in high reputation for mixed mental affections, giving rise also, during a voyage, to most novel and enjoyable sensations, such as were most beneficial to the voyager. Plutarch looked upon severe sea-sickness as positively *routing* all old complaints or diseases. In some cases, sailing in calm waters was more desirable and beneficial, producing no exhaustion of the frame. The latter is rather for pleasure—like the soft motion of a carriage—and cannot produce those intense effects, such as the concussions of sea-sickness on the entire viscera, which led Arctæus to declare, rather dogmatically, yet doubtless with much truth where it can be borne, *that sailing and a sea life were all the remedies in nephritis*. It is in this respect certainly equivalent to the strongest exercises.

A similar custom has obtained among medical practitioners of the present day, who send their patients to the Australian and other of our colonies in warm latitudes; and with the greatest success in many cases. So much, indeed, is this practice in cases of confirmed phthisis increasing, that we are glad to annex to this some very useful observations, extracted from the "Medical Record" of Australia, which appeared in this country in February, 1862. The following extracts show, as

we, partly from our own experience, can attest, that many might be saved who must inevitably sink in this country; but that, while the chances are largely in favour of those whose circumstances place them above the necessity of working for their livelihood, they are decidedly against those who are obliged to gain their living by manual labour alone, particularly where there is much exposure to vicissitudes of temperature.

The writer says, "The climate, under certain circumstances, is highly favourable for those suffering from diseases of the lungs. For instance, if the disease is chronic, and the patients suffer but little in the summer months, it will be found beneficial. It does not matter, in consumption, whether one lung is extensively diseased, or whether the upper third of both; for I have seen cases arrive here with large cavities in one lung, or with cavities in the apex of one lung and induration in the upper third of the other, and yet do well; but in none of the cases was there extreme emaciation or debility. I think I am justified in saying, from having carefully studied the disease in England and here, that persons with large cavities, which would be certain to cause a fatal termination there, would have here, with great care and attention, a great chance of recovery, or of living for a number of years. In England, patients with cavity die from the profuse secretion from its walls; but here, unless the walls of the cavity are breaking up, or inflammation of the trachea or bronchial tubes exists, there is but very little expectoration of purulent matter—the quantity seldom exceeding one, two, three, and four teaspoonfuls in the course of the twenty-four hours."

Remarking on the danger, as well as inutility, of sending out consumptive persons who are obliged to labour with their hands for a livelihood, he says, very truly,—“The great, and often sudden, variations in temperature—the intensely hot sun,

followed by very cold nights—render the climate exceedingly trying to those possessing the strongest constitutions; and, therefore, those who came out here with a predisposition to consumption, soon fall victims to the disease.” Yet this is not a general rule, for many are so strengthened by the voyage that the disease is often cured, or at least delayed, for years. On the latter point—the voyage—he makes a remark well worthy attention:—“Patients are often sent here without any reference to the best period of the year for their making the voyage without being exposed to severe weather on the English coast, or during the latter part of the voyage. The best season for consumptive patients to leave England is from the latter half of September to the first half of October, as they are then nearly certain of favourable weather throughout the voyage, and they arrive here in the hot months.” This is perfectly correct; and, as it may appear arbitrary to fix so narrow a limit to the days of departure from this country, it may be as well to state that the foregoing has been fully tested by experience, whilst very stormy passages have occurred at those periods which lie between spring and autumn—such as the latter part of June or July—to vessels leaving this country in those months. In another part of the paper he adds:—“The little influence which an hereditary tendency has here in predisposing to consumption is of considerable value, inasmuch as it shows that if persons with a consumptive tendency are sent out, they have, *if they are not exposed to the vicissitudes of temperature to which those who have to get their livelihoods as servants and labourers are exposed*, as I have before observed, a chance of throwing off the disease.”

We cannot help adding the testimony, of an almost identical character, of so good an authority as Sir Ranald Martin, in page 631 of his work on “Diseases of Tropical Climates.”

Treating of the necessity for a person leaving for a hot climate being able to bear the heat of his own, he says:—"In the instance of Europeans desiring to proceed to India, or in those of officers wishing to return to their duties there, I always rest the question of their fitness to encounter the climate on the existence, or otherwise, of organic disease in any of the three cavities. Where, on careful examination, none such is discoverable, I determine at once that such a person may proceed to a tropical climate with an average probability of enjoying health. When any considerable degree of functional disturbance is apparent, within the cerebral or abdominal cavities especially, I call for delay, and await its removal. As a general rule, no one, well or ill, should be sent to a hot climate *who bears the heats of European countries badly*. On the other hand, where there exists an hereditary or other disposition to morbid affections of the chest, I recommend such persons to proceed to India, as offering the best prospect of escape from a condition of disease which, in England, terminates too frequently in hopeless pulmonary consumption. Such, in a few words, are the principles on which I have been in the habit of resting this important question." The result of care, or otherwise, in the way of living, among consumptive persons in Australia, and such-like climes, is the same always; for we have known instances where life has been prolonged by such care for thirteen and fifteen years, in cases considered hopeless when sent out from this country.

All those mimic sea-fights which are found represented on old Roman coins were exercises for the soldiery, as well as sources of amusement and delight to the people. They were especially useful during the Punic war, in which naval discipline, to cope with the Carthagenians, was abundantly required. The Romans exercised their soldiers evidently as much on sea as on

land, and this gave rise to the festivals of the *naumachiae*, or mock sea-fights. For these contests, special buildings of great size appear to have been raised, and supplied with water from the aqueducts. In these, galleys were chiefly used by the combatants. And there can be no doubt that these displays assisted greatly in firing the Roman youth with that ardour of conquest by means of which the empire was not only extended but held together.

Fishing is styled an exercise by many old writers; condemned by some, and approved by others. It is, however, scarcely an exercise, except it be placed among the weaker kinds; though under favourable weather, both by sea and on the banks of rivers, it is a most healthy and enjoyable recreation of the mind and body. Of this our own Izaak Walton has not sung in vain.

Swimming is a different matter, and was then, as now, a strong exercise, and one requiring great physical endurance. Among the ancients, boys were taught it as one of the first elements of learning; so much so that they had a common method of reproach for ignorance, to the effect that the person *neither knew his letters, nor how to swim!* From their earliest years, both nobles and common people were trained to acquire skill in this art. Not only in naval battles was it essentially necessary, but in the fording of rivers, wherein multitudes of soldiers were constantly lost through ignorance of swimming or fear. After intermittent fevers it was usually resorted to, but generally in the public bath, and is certainly more advantageous in such cases if the water be warm or tepid. In some instances their bodies were first anointed, and a good deal of friction used, for the purpose of warming them, and diffusing the circulation over the surface, before plunging into the water. The use of friction in this example might well be

applied in our day, as being serviceable in many cases where, owing to a want of reaction from the bath, so many suffer instead of gaining benefit from it. It was recommended as an exercise for the gouty; and even in the present day, where there are power and facility of movement, it is serviceable both to the gouty and the rheumatic. There are many records to show that *warm* or *hot swimming* baths were built in several places in Rome and near the sea-shore. There is a marked difference too, so far as diseases affect this matter, between swimming in salt and fresh water, as well as in regard to the exercise imparted by it. The ancients created for the purposes of treatment, as well as the maintenance of health, several distinctions. First, as to whether the swimming was performed in water moving spontaneously as it were; either in soft water or sea water; if in soft or still water, as in rivers, lakes, and standing water; and all these, either in their hot or cold states. Aristotle approved of the swimming in moving waters, provided they were hot. It was useful to paralyties; and when it was so administered we are told that the suffering parts were supported by inflated bladders, by which the labour of swimming was diminished. They disliked standing waters, preferring either the sea or flowing rivers. Salt-water swimming was prescribed by Aretæus in chronic pains of the head; by Galen, in lesions of the faculty of smell and fulness of the nostrils, provided it were done energetically and assiduously. Celsus reputed it also advantageous in dropsy, scabies, and in cases of persons labouring under most of the exanthemata, elephantiasis, and defluxions from the body. It was used also by those who were not nourished by their food, and in paralysis; the sea-side attempts were considered the best. By Celsus it was recommended in sickness of stomach, affections of the liver and spleen, and in cachexia. Hippocrates

states that cold affusion, copiously applied, is a remedy for persons afflicted with contractions of the muscles or convulsions of a tetanic nature. Celsus recommended the swimming in cold sea-water in summer for *scrofulous* persons. The movement and concussion of the salt water of the sea also produce a more decided influence upon the skin, to which it is an excellent tonic in all who are strong enough to bear it.

Among all these general methods of exercising and improving bodies, we come at last to *hunting*. There is a famous sentence of Galen on this subject, to the effect that of all exercises hunting undoubtedly appears the most useful, producing not only fatigue to the body but delight to the mind. Man in his wild state is a hunter, and the toil with which the prize is at length secured adds to the enjoyment of it when so obtained. The great fathers of medicine, with severe prudence, caused hunting to be esteemed and followed as a most healthy exercise. The hunting they approved was, like the fox and stag hunting of our own day, a bold, manly form of chasing animals, without nets, art, or stratagem of any kind. In those times, as now, they pursued their prey with horses and dogs, as well as on foot, and thus exercised themselves in striking, contending, throwing, and running. Plato, under the designation of *athleton*, declared it contributed very much to military exercises, and especially served for cavalry soldiers. This form of exercise was sometimes represented in the amphitheatres before the emperors, in which a large number of savage beasts were slain. It is related by an old Arabian physician that when the plague raged, whilst almost every one perished, the hunters alone remained unhurt, on account of their high healthy condition through assiduously exercising themselves. Nor should the old anecdote of Dionysius of Syracuse be omitted, who on one occasion, at supper, declared himself

ntterly dissatisfied with the food served up, and to whom his cook, when taken to task, immediately replied, that it arose entirely from his not having laboured for it by hunting or running. He was, therefore, wanting in that hungry condition with which Lacedemonian banquets were usually relished. The celebrated King Mithridates is said to have given himself up with great avidity to hunting, and for seven years, whether in town or country, he slept under no roof. They esteemed, however, the hunting on foot before that on horseback. Hawking was a most common form of snare-hunting, as we may call it. Their hawking differed from ours, inasmuch as it was usually done on the borders of fens, or reedy lakes and lagoons. Among the reeds the hunters concealed themselves, and at a concerted signal roused the birds, which, on rising, finding themselves pursued by hawks from above, stooped again towards the ground, and were then knocked on the head as they passed by the concealed hunters. Some writers think, however, that the ancients were ignorant of the art of training hawks, as well as hunting with trained dogs; but of this we should judge otherwise.

Galen was quite right in saying that hunting was not to be performed without strength, agility, and despatch; like many other exercises, such as running, walking, jumping, and the like. Xenophon declared that it sharpened the hearing and vision, and together with these retarded old age. It should be borne in mind notwithstanding that the same dangers and precautions surround this as they do all great exercises, namely, over-exertion, and hastening to food too soon after such exertion. Many have suffered from passive congestion of the brain in consequence of the former. During the hunting on horseback there are still some most excellent effects, such as the conditions of walking at one time, of galloping at another,

of shouting or remaining still at other times, thus strengthening chest, stomach, bowels, back, and limbs. Persons, however, should be in fair health; that is, free from any serious functional or organic disease, for the latter especially may be augmented by it. The differences too between hunting on horse-back and on foot are so obvious that we need not refer to them specifically. Hunting was said also marvellously to promote chastity in men, for the ancients always ascribed to the goddess Diana, patroness of the chase, a pre-eminence in this virtue. As Dionysius' cook testified, as we have seen already, it was also a wonderful improver of the appetite, whilst it often occupies an entire day in its pursuit. During the day very scanty amounts of food should be taken. In some cases hunters take too much food in the day, which is very detrimental to health; or they are empty the whole day, by which, although it is decidedly the least injurious, the internal organs are thrown out of their usual functions, and in consequence of this the hunger becomes great, and the stomach debilitated and exhausted in almost the same ratio. And the latter occurs also in that entire bodily exhaustion which all muscular efforts injudiciously prolonged are sure to entail.

CHAPTER IX.

General effects of Bodily Exercise, and its importance in preventing Disease—

The probable origin of certain supposed Mechanical Impediments to the Circulation of the Blood—Exercise and Food—Varieties of opinion for and against Exercising the Body.

LET us now consider the methods of using exercises, and their general adaptation to our social position as well as the purposes of health. There is, of course, in the previous chapters a good deal that is useless and purposeless in the advanced state of knowledge of the present day; and, again, there is many a hint of value, which will last all time, to be picked out of this apparent rubbish. It is in the main also a record of what was done by a great and mighty people long since passed away; and while their writings are used in the education of youth at the present day, and have been so used from the earliest periods after their departure so to speak, their *principles* of education are virtually ignored and set aside. The latter are the more necessary as their advantages and disadvantages are of great moment to the well-being of us all. We shall proceed, therefore, to discuss what ancient and modern experience yields of the effects and value of the several kinds of exercises, and what principles and results are attached to them.

It is often with exercises as with drugs and other things applied to the body, that, while they agree with and improve

one part, they may, through carelessness, damage other parts : it is not so, however, to an equal extent. Exercise can rarely be given without embracing nearly the whole framework ; and, however *local* some of the applications appear, they are, nevertheless, instruments for promoting the harmony and unity of the system. A very little reflection will, we trust, convince the reader of the truth of this, whilst it will be our care to bring all the facts we have gleaned from time to time to bear on this question. The grand leading feature which the ancients have presented to us is the many fatal diseases which idleness and total abstinence from all labour impose upon us. Or, again, through ignorance of the proper uses of exercise, as well as running into excess of it, fatal organic mischief may equally be induced in the body. We learn from Divine Writ that this impulse of the body is given us instinctively by our very nature. Yet Nature has a method ; and therefore we are wrong if we apply these things without a method, in bad order, or with entire unsuitableness. We may here profitably digress a little, to learn what modern science may be able to suggest in a few points by way of illustrating our subject.

It is certainly a matter of deepest concern to us all when we reflect on many of those insidious processes, from which no one can say who is or is not exempt, which are productive at one time of sudden death, at another of lingering imbecility and decay, and at another of loss of a limb or some important bodily function. If most of these phenomena are due to *lowered vitality*, it is certainly worthy of consideration how far temperate living and a proper amount of daily exercise will avert them. We here allude especially to those examples where *coagulated fibrin* is found not only in the large vessels of the body but in the capillary portion of several of its organs. The formation of these concretions is thought to depend on the

circumstance of the *blood* being deficient of vital power, and therefore "conducting itself as it would in an inorganic recipient, and obeying merely physical laws." These coagula are known to form after severe fevers, and even in bodies which have not been, as might be supposed, exhausted by chronic disease. If the substance of an aneurismal tumour, after the successful application of *pressure* (such as a popliteal aneurism which has been successfully treated in this way), is gradually absorbed, and nearly all trace of the disease removed, it is fair to conclude that these depositions of coagulated fibrin are more frequent than we suspect, and that Nature in some way either removes or renders them innocuous in course of time. None can say how frequent, or otherwise, these obstructions of blood-vessels occur, especially in the more important organs of the body. We do not say dogmatically that this is so, but we know that we are not alone in believing it to be a subject worthy of searching scientific inquiry.

Until these vascular obstructions became fully manifest, every occurrence of the kind was declared to be due to local inflammatory action. *Softening of the brain* was, till a recent date, considered to be due to inflammatory action, and it was Virchow who first pointed out that the disease had its origin in one of these obstructions. In some cases, as those of the extremities, *gangrene* has been induced, whilst the arteries which are plugged, often at their bifurcations, are found to be ossified, yet not always so. It was at first thought that fibrinous clots were carried from the heart into remote branches of the arterial system, yet it is now supposed they may be purely of local formation, or, in instances of approaching death, they may receive their primary development from the heart. In some examples of these *emboli* it is thought that the formation, when found in the lungs, may have come even from one or other of

the extremities. The diffusion of portions or the whole of one of these local deposits may possibly lead to inflammation of the capillary branches of an organ, as well as give rise to abscess and gangrene, as it is known, of the deep-seated parts.

However appalling these conditions may appear, it should still be borne in mind that, happily for the human race, they are of comparatively rare occurrence, and are generally due to an advanced stage of impoverishment of the system, or the bloodless state which severe chronic disease may gradually produce. The former are conditions both allied to, and productive of, acute *tuberculosis*, which disease, we think, singularly exemplifies the simple course above noticed—of obstruction, inflammatory action, abscess, and, at times, gangrene. The sudden deaths which have occurred in persons afflicted with *phlegmasia alba dolens* are considered to be due to pulmonary obstructions. It is probable that many serious affections of the liver, especially among those who suffer from these disorders in warm climates—dysentery among the number—have their origin in obstructions of the portal vein or its branches. Abscesses of the liver may be found to be due to these circumstances entirely. Peritoneal inflammations would be connected with morbid or arrested circulation, and hæmorrhoids are the probable terminal points of distant or near local obstructions. The apoplectic seizures which have followed, in some cases, the sudden disappearance of hæmorrhoids, may be due to the same mode of transference we have remarked in the before-mentioned instance of *phlegmasia dolens*. In treating these cases, the greatest care is requisite, for in most of them the day for exercise, or warding off the tendency to the disease, is gone by, and *perfect repose* should follow the discovery of mischief. If anything can be done externally, by way of manipulation, it should be tried, and has a fair chance of doing some good.

We last year met with an interesting case of "Embolism of the femoral artery, causing fatal gangrene of the foot." The patient was a man of about fifty-five or fifty-six years of age. He had previously been suffering from an attack of dropsy arising from disease of the heart, of which he had so far recovered as to be able to walk about the wards of one of our hospitals.

"On the 17th of December," we are told, "he was seized with violent pain in the left groin, and the leg on that side became perfectly powerless, cold, and numb, and he was in great pain during the remainder of the day and that night." On the following day he was still "suffering great pain, especially in the groin. The limb was lower in temperature than the rest of the body, and there were patches of discoloration extending over the dorsum of the foot and toes, with some degree of œdema; the leg was red and inflamed-looking to about midway between the ankle and knee."

"On examining the groin at the spot where the patient had first felt the pain, a hard, round substance was felt; it was about three-quarters of an inch in length, and rolled under the finger. Its position was exactly in the course of the femoral artery, about two inches below Poupart's ligament. As the patient was very thin, there was no difficulty in making out its size and form; and it was at once pronounced to be a plug of lymph in the artery. Above the plug pulsation could be distinctly felt, but below it there was no pulsation whatever in any of the vessels of the limb. The general appearance of the patient was unhealthy, and his skin had a yellow tinge, his countenance sunken and anxious, pulse intermittent and feeble, heart's action intermittent and weak; but no valvular disease could be discovered."

Notwithstanding every sort of means being tried, in the way

of embrocations and stimulants, gangrene commenced in the toes, and spread slowly through the foot, but ceased after having involved about two-thirds of the foot. Yet the patient gradually sank.

Upon examining the limb after death, "it was found that the plug was situated in the upper part of the superficial femoral artery, at the origin of the deep femoral; the surrounding tissues were much thickened, and the artery was firmly adherent to its sheath, and also to the vein. The plug was adherent to the inner coat of the vessel. It had a rusty appearance on the surface, but of a fawn colour in its interior. It strongly resembled the fibrinous layers of an aneurism. The heart was large and flabby, but there was no endocarditis, no disease of the valves; several large masses of fibrin, however, were found entangled in the fleshy columns of the left ventricle; they were mostly of a fawn colour, very firm, and apparently of long standing. A large mass of fibrin was also found in the left auricular appendix, and partly projecting into the auricle. There were also several loose coagula, of recent formation, particularly in the right ventricle. The large vessels were all apparently healthy. The lungs were inflamed at their bases. There was a large mass of fibrin at the upper, and another at the lower, part of the spleen; they were of deep yellow colour, and firm in texture; the arteries leading to them were also found blocked up with fibrin. The other viscera were healthy."

The opinion in this case was, that the plug had, in all probability, come from the heart. This, however, only accounts for the plugging of the femoral artery, and not for the collection of fibrin in the *spleen*; and it is probable that neither of these conditions would have occurred, had it not been for the flabby weak heart, general slow circulation, and low

tone of the man's entire system. The whole machine of his body was faulty.

We fully agree with the remarks of Dr. Budd, in his Gullstonian Lectures for the year 1843, where he argues that certain abscesses do not arise from depositions of pus brought from a distance and left in the particular parts in which they may be subsequently found; as, if it were so, blood corpuscles, which are much smaller than those of pus, would simultaneously escape from the conveying vessels, and be found intermixed with the contents of these cavities. But on the contrary, he thinks that particles of pus generated in an inflamed vein are indeed conveyed to the parts in which the abscesses occur, *but that it is their arrest in some one or other of the minute capillaries through which they have to pass in the course of the circulation which gives rise to surrounding inflammation, terminating in suppuration; the particles conveyed thus causing the formation of the abscess, but not constituting the bulk of its contents. He compares the influence of the purulent globules thus mixed in the blood to that of the small globules of mercury, which are found to constitute the centres or nuclei of purulent formations, when that metal has been injected into the veins.* The above is certainly another illustration of mechanical action in the body producing disease in it.

To resume. Galen has offered us one important rule; namely, *that persons should properly and suitably exercise themselves before taking food, especially when they have not the labour of searching for it.* We may all correct that great error, which springs from excess in eating or drinking, of damaging the body still further by trying to correct with drugs the pure results of excess,—thus burning the candle at both ends; just as some injure themselves by having no reasonable plan, order, or time for their wonted exercises. Thus it was that, as already

declared, the gymnastic art with the ancients, as with the moderns, was, and should be not so much belonging to the curative as to the conservative part of medicine. Yet among all sects of the ancient physicians, and especially the *Methodists* or *Methodicians*, of whom Asclepiades was one of the more widely-known, some forms of exercise were strongly recommended in the cure of chronic disease. The works of Celsus, who followed Asclepiades in many things, Aretæus, and Galen, abound in illustrations, that great things may often be done with exercises which can be administered without any danger to the healthy body; while for the sick, walking, gestation, horse-riding, and the like, are provided. They often co-operate with other medicinal means,—as the great Sydenham and others have abundantly testified. On the latter ground, too, it is fair to consider what the ancients had to say in treating *disease* with exercise. It is worthy of observation, too, as arising doubtless from our classical sources of knowledge, that our games are so like theirs,—the ball-playing, quoits, boxing, running, and many others, differing only in feature, certainly not in effect. Their unguents and powders, of course, we have entirely banished. According to a remark of Hippocrates on the latter, many of these applications to the surface of the body arose from their absence of clothing, as well as the extremes of heat and cold at various seasons of the year. In those days also, the bulk of mankind were only really satiated with food at the latter portion of the day, which regulated their plan of previous exercising.

The three principal differences in the exercises recognised by the ancient physicians were—first, the *preparatory*; second, the *curative*, or good effect produced by strong exertion; and third, simply the matter of ordinary *exercise*. The object of the preparatory was to obtain density in the solids of the body

and correct their laxity. The curative were applied in numerous ways already given in this volume, and the last was recommended to those who, accustomed it might be to the labours of the palæstra, were, on account of the active duties of life, compelled to give them up. Yet the main differences of exercises, simply understood, are such as explain their external qualities; such as their effects, localities, derivation, and the conditions they are intended to produce. Therefore it is that those who exercise in hot places are more parched, and in humid more oppressed; whilst bodies are, and with great probability, thought to imbibe during exercise the qualities of the air of certain localities. As to *modes* it is evident that perpetual or continuous exercises and the like fatigue more than those which are unequal; so that *intense* motion implies that which is individual, continuous, and unaltered in its character. Consequently, the *unequal* does not fatigue so much, because repose is derived from different changes of action as well as posture, and the exertion thus distributed in all parts is less perceived in each. The interruptions, in fact, yield repose, and repose lessens the fatigue.

The exercise they performed after rubbing with oil was considered more prompt in removing lassitude and giving greater vigour of movement, for the sake of which, and to remove the dryness of their skins, old men of ninety, we are told, used it. In such as took place under the use of powder, there was thought to be some advantage from the perspiration being arrested in its flow from the body; for the powder, according to Galen, had a plastic, refrigerant, and repellant force. It was recommended to fat persons when exercising in hot places. A considerable effect was produced if the powder were rough, like that of pumice, or sharp, like nitre. In the

differences as to quantity of motion, Galen states that much dried the body up—which we suppose means, that it produced atrophy, and a middling amount rendered it obese. The latter to many persons may appear an absurdity, but we believe that where there is a tendency to make *fat*, a *small* amount of exercise is just the thing to induce it. On account of the latter also, we learn that C. Aurelianus, a distinguished member of the sect of Methodicians, commends very many exercises for preventing much flesh. There is no doubt that the stronger empty the frame of superfluous exerementitious material, and that the lesser have little or none of this valuable influence, apart from diet, in preventing accumulations and excesses in the system. Galen considered on the other hand that sharp, rapid, or swift exercise attenuated bodies, lessening the solids and fluids, on which account, both he and Ætius recommend them for curing a person of obesity. The gentle and slow, they also said, make fat, and induce grossness; the medium effect is produced, by such as range also between the two. Strong and robust exercise, on the contrary, develops animal heat, generates profound sleep, and assists the digestive and assimilative processes as well as the excretory functions of the body. It is to the latter that it is so indispensable an adjunct, that without it, or without extreme care in the quantities of food, the body can hardly escape laying up the seeds of future disease. Celsus declared that insane persons were to be exercised violently, and this may have arisen from observing that persons so afflicted appear to experience some relief or mitigation of their sufferings in the violent muscular efforts they make during the maniacal paroxysms.

Although a good deal that is here laid down may, to many persons, appear a vain repetition of subjects not very important in themselves, we must reluctantly differ from them,

inasmuch as it is necessary we should know what good and what evil there is in exercise, and what we ought to embrace, and what avoid. No one can be less bigoted to the customs of the ancients than ourselves ; we seek only to know what amount of truth there was and is in their practices in this respect. The greatest interest must ever be felt in the exertions of those men who brought gymnastics to great perfection ; so much so, that the physicians were led both to investigate their merits, and make use of their aids in the restoration of the sick. We propose, therefore, to treat the subject, first, under three different headings ; secondly, we shall show what bodies are fitted and what are unfitted for exercises ; thirdly, where the place should be in which those exercises are to be performed, especially such as are studied for the preserving and confirming of health ; and fourthly, what time was most fitted for exercising.

As every species of exercise does not suit everybody, so in the same way the place and time may not agree ; and on this account we might be allowed to add a fifth, as to what may be *enough* exercise, and even subjoin a sixth, of the manner in which exercise should be undertaken. Through ignorance or neglect exercise has been, and will be, made rather detrimental than suitable. Galen's words are worthy of earnest attention, and should be carefully weighed, especially by those who consider how much healthy offspring depend upon the health of the parent stock, making it equally an individual as a State question. He has written that it should be opportunely and prudently administered, both for correcting the errors of men in regard to their food and the management of the body and effacing a possibly injurious stamp altogether from their posterity. It was found that the stomach was improved in tone, and with it the rest of the body also, so that

men were less susceptible to the inroads of disease; and in the same degree, it was discovered, that by neglect of exercising men were perpetually tormented with infirmities and as constantly taking physic.

Some persons we find condemn exercise in the healthy state, and deny both the necessity and profit of it. Galen mentions that there were three sects, with as many opinions. Some of these maintained that any exercises whatever, were rather hurtful than useful to health; others wished to forbid no one from exercising; others took a middle course, and judged that those only who were accustomed to it should exercise, and denied exercise to those who were unaccustomed to it. We are, therefore, led to consider the opinions of all these. The opinions of ancient physicians on these subjects are especially interesting and instructive. Asclepiades and others believed that the use of medicaments and blood-letting would supersede the old uses to which exercises were placed. They stated that exercises to the healthy body conferred nothing, and to this assertion they were led by many reasons. The first was, that the health of all the *humours* depended on an equable temperament, that these humours were concocted, and that this concoction was better effected by quiet, as indicated by sleep; by motion, as by exercise, it was impeded, and not unfrequently corrupted, whilst it necessarily depraved the harmony of these secretions, and health itself was thus destroyed. Another reason was, that all exercise annexed labour to it—labour that appeared in some measure inimical to nature; therefore, that which produced pleasure and comfort, of which the healthy man ought never to be deprived, arose from the middle course, and thus the former was rather hurtful to health than otherwise. The *third* reason was, that as lost health is regained by quiet and not by exercise, by the same means also, and not by

any movement, it is preserved. The *fourth* reason was, that too much heat is produced by exercise, and consequently, the natural humidity is exhausted (!), by which two conditions no one could doubt that health was destroyed and not preserved,—health consisting in moderate heat, and a commensurate natural humidity. They added, moreover, that many daily spend a healthy life in prisons, who are in no way able to take exercises, and these persons appear to support health without it. So far these old physicians were led by reasonings to believe that exercises were not to be brought to the healthy body; and yet all confess that this does not agree with what is so visible in the natural utility of exercise! Whilst they considered that the atomic particles were continually given off from our bodies, so it appeared that unless they were as constantly renewed life was easily destroyed; that by food, as long as we live, the effluent particles are regenerated or restored; which is a work continually going on. They observed too that there were accumulations, so to speak, which would serve to choke the machine. This intuitive sagacity enabled them to perceive that the body should be thus purged by various channels and ways, which undoubtedly was not done by the common evacuatories while it was in a state of repose, but that we stood in need of exercise, so as to arouse the great function of the skin—the sweating process, in fact, and separate the particles by sensible and insensible perspiration.

On the other hand, if, through swiftness or torpidity, any of these excrements were retained, it was hurtful, and many forms of mortal disease were generated thereby; and therefore it was that Soerates is said to have taught that *the strength of the body is destroyed both by violence and idleness, but preserved by exercises and movements*. Hippocrates fixed the grounds on which he considered a healthy life might be maintained and pre-

served,—by *shunning satiety of food, and by frequently exercising the body*. By the latter every operation and function is enlivened and increased. The Father of Medicine has also added, elsewhere, *that the man who eats largely is not able to live healthily unless he labours*. But it is only fair to add to such testimony the reasons which Asclepiades and others gave for their views on the subject. First, they believed that health was established by an equality or harmony of the humours or secretions of the body, and this, as said already, by concoction, or, more correctly, assimilation of the best juices; so that the latter process was better effected by quiet, and *we* think not a little assisted by the exhibition of exercise moderately and opportunely. The body is by the latter chiefly relieved of its excretions, which accumulate to its injury. If exercises can help the latter, they must lead to the preservation of health; but they do more, for they assist the former. We quite agree with these writers that the concoction or assimilation is vitiated by excessive motion; yet seasonable motion, which the ancient physicians defined to be proper exercise, they in the same way ordered to effect it.

There appears then to be an open inconsistency, if not falsity, in the bulk of such dogmas, the more so because the greater exertion produces more profound sleep, by means of which digestion is afterwards better performed. Galen very reasonably declares that persons given up to improper food are not hurt by much exercise, by the labour of which profound sleep ensued, and the best results followed such sleep. Moreover, what is asserted in the *second* reason to be annexed to laborious exercise, and to the healthy, combined with pleasure, and even augmented health, we can partly confirm and partly deny. If every kind of endeavour to remain healthy does not exceed due proportion, nor last too long, it is attended with pleasure and

satisfaction; just as the body, when relieved of its superfluities, enjoys numerous sensations of delight and gratification. In the same way we may view the *third* reason; for the use of animal food is not to be condemned because some of the ancient physicians cured many affections by making their patients fast three or four days; though for the sake of preserving health they would not have thought of doing so. One of these was a physician of the name of Erasistratus, who lived 257 years before the Christian era, and who was a great enemy to bleeding and violent physie. Regarding the use of medicines, the simple plan of Hippocrates and his followers was to test each drug by numerous experiments, and if they stood the test satisfactorily, they were admitted and approved. At the same time they distinctly taught that the *healthy* were not to be assisted in maintaining it by these medicaments, for they greatly injured *health*; reminding one of the celebrated Italian epitaph,—

“I was well, I would be better, and here I am.”

So that it is sufficiently patent the assumption of persons so arguing is based in error.

The *fourth* reason given by such persons was that the body suffered through the abstraction of its heat. The balance, however, of the stock of animal heat is clearly in favour of exercise, as constantly giving birth to it, whilst the loss by evaporation is more injuriously felt from undue inactivity. The old belief was, that there existed a motive power of heat even in the animal machine; and, so far as *mechanical* action extends, the question arises whether *motion* is as requisite in the animate as it is in the inanimate in the developing of heat. Doubtless Sanctorius meant something of this kind in his advocacy of sweating, and the attrition of the various humours of the body. Galen has rather humorously likened flesh used to exercise to

cheese perfectly coagulated, and that not used to such a process, to the coagulation slowly coming on. Then, as to persons in prison passing healthy lives without exercise, they, in the first place, do not take into any account the multitudes who have died in prison, or the fact that many persons in prison, though not requiring it, often take more real exercise than those out of it. This they do instinctively ; just as Gouger and his companions, while imprisoned in the cages in Burmah, crawled over each others' backs, kneading each other with their knees, and in many other ways relieved each other from the sufferings and distress induced by their cramped and confined positions. But not only in cases like the latter has deformity been brought about by want of exercise in prison, but their bodily functions, even their complexions, are changed. Yet many live long in prison, as animals of another class are found to do in cages ; and the prolongation of their lives is due to the care and frugality with which they are fed, and the adaptability of their food to the circumstances in which they are placed. Our exercise in this and all cases should bear its proportion to our actual nourishment. The firmness and healthy condition of exercised bodies, on the other hand, enables them not only to resist the inroads of disease, and prevent its mastery in a great degree, but renders them better adapted than the unexercised for the common duties and requirements of life. It certainly, both mentally and physically, renders them more capable of the higher duties. In all time the human race may look, as it has looked, in vain for a better auxiliary in the preserving of health.

There is another class of opinions which lay it down dogmatically that all men ought to be exercised without any selection whatever. This seems to have arisen from a misconception of the extent of range of the old maxim of Hippocrates,

that *labour should precede food*; and on this assumption every one in those days exercised before taking food. All men, it was said, delight in exercise, and all men have the same amount of bodily or functional changes to be effected during waking hours. Yet, as Galen very properly said, we can find no one wholly like another; what profits one, wholly disturbs or injures another. Some are hurt by medicines, others profit by them; and the same conditions apply to exertion of every kind. Still, exercise in these persons may be supplemented, so as not entirely to do without it; such as by bathing, frictions, and gestations without any vehement motion. Galen has shown another condition also, where health may be preserved by abstaining from exercises on account of impending diseases, and in some cases warding off the same by the timely use of the bath and other measures; for it must be ever borne in mind that the ancients possessed very little aid from the resources of medicine such as are so abundantly known and provided at the present day.

There must be also a distinction made in the case of persons who, born weakly, derive considerable advantage from exercises. Socrates proved, in his own case, that the most infirm by nature, if they exercise, get stronger than those endued with natural strength, but who are unexercised. Galen corrected the natural deformities of many by means of moderate exercises, and he declares that he regenerated them as if with new bodies. The sick and the deformed person occupy distinct positions in this matter. And yet nothing is so hurtful to the frame, as Galen admits, as a degree of torpor by means of which the very members of the body become weak and flaccid, leading not rarely to destructive diseases, which either slowly end in death, or in the perpetual impairment of health.

It was an equally valueless, if not false dogma, of many who judged those persons only fit for exercise who were accus-

tomed to it, whilst in no ease were the unaccustomed to be exercised. There is yet some truth in this though there is much error, for in the latter case, it attributes too much to *habit*, placing it above the conditions of nature. It seems to have come from an incorrect reading of the rule laid down by Hippocrates; namely, that *those who were accustomed to bear ordinary labours, although they were weak and old men, bore them more easily, and with comparative strength and vigour, than those who were not so accustomed; and those who had to endure for a long while, although they were weaker, yet they were less incommoded than those who were unused to such physical endurance.* The reasons for all this are, that people in general adopt as a custom that which is suited to their own nature, rejecting what appears hurtful, and adhering to what is an assistance to them. Whence it is fair to suppose, that the custom of exercising should be kept up by those who are familiar with it; but those who are habitually inactive are not to be drawn from the latter, certainly not suddenly, as it were, and especially if they *instinctively* seek quiet and repose. Secondly, because in the opinions of philosophers and physicians custom passes into nature; and on that account, not otherwise, change would appear to hurt that custom, and those persons pervert nature who attempt to do violence to it. The third was, that if persons have lived a long while healthy in perfect quiet—which may be very likely—in the same way health will plead for remaining in the same quiet course of life; so that in changing from this to the opposite condition they might incur various maladies, from the entire alteration of their mode of living and other circumstances consequent on such changes.

Led by such reasons as these, such persons constantly affirm that custom ought not to be changed; that those accustomed

to it should exercise, and those accustomed to quiet should remain so. That these opinions are in the main erroneous we need not take special trouble to prove. It is an overstraining of the meaning of the Father of Physic, and doubtless, at one time, originated in a too literal reading of his fiftieth Aphorism, section 2, which, according to Sprengell's version (1708), runs thus :—" Things we have been long accustomed to, though worse, are wont to be less troublesome than those we are not accustomed to. And, therefore, a change is not to be made to things we are unaccustomed to." From this, the dangers of lapsing into the inactive state as regards our muscular system are clearly manifest. Although Bacon laid down the law, that it is better to change many things than one, he at the same time enunciated a very clear natural law, which says—" vary and interchange contraries." That there is a wide range of truth in the latter, doubtless the personal reflection as well as experience of many of our readers will abundantly testify. If a person is become actually diseased through inactivity, then there can be little question of the propriety of repose, or extreme caution in interfering with his physical habit; but not otherwise. We are surely not to cling to a bad habit, nor would it be wise to say that custom should never be changed. The physician's duty is to amend the natural defects in our way of living, and such as arise from the "accidents of existence," and there is no reason to suppose that we are not able to change the very worst habits into such as are more wholesome. Persons are surely more easily divested of that which has been contracted by habit than that which at the beginning has been transmitted by nature. Thus it is, that the custom of living at ease is pernicious, because, as Celsus says, *a necessity for labour may arise*. There may be a peculiar pleasure in habits of sloth and indulgence, but few persons can rightly

estimate the slow yet certain mischief thus set up in the frame, leading on to the sudden development, oftentimes, of malignant and incurable disease. Whilst healthy life is evidently elaborated out of our universal desires, the very fact would at once destroy any dogma which favoured either persistent repose or persistent bodily exertion, but rather that condition which the poet so well describes,—

“From toil to rest, and joy in every change.”

The effects of exercise on those unaccustomed to it, and therefore showing the necessity of a degree of *training*, are seen in examples that might be multiplied to an unlimited extent. Dr. Corfe, in a paper published by him in 1853, on “Emphysema of the Lungs,” states that persons who attend the hospitals afflicted with that disease, and bronchitis, are commonly those who are ill fed, and consequently anæmic and weak. Thus, charwomen, after having been out of employment many weeks or months, and who had lived chiefly on tea, bread, and vegetables, when they obtained a few hard days’ work of washing, were seized with dyspnoea, cough, and expectoration; in other words, they were found to have *emphysema* of one or both lungs. Labourers and navigators, also, who had been out of work for a long period, and had been unable to procure animal food for many weeks, when they returned to the use of the spade, pickaxe, or stone-rammer, found oppression at the chest, wheezing, dyspnoea, and cough, &c., the fruits of incipient emphysema. He mentions the following as corroborative of this:—“Dr. Goodfellow informs me, that emphysema pulmonum is very common among the coalwhippers in the east part of London. These men drink largely of porter, and eat animal food sparingly. When they raise the coal from the hold of the ship, they fill their lungs by

a forced deep inspiration, grasp the rope, and leap from the step to the deck, and then as suddenly expel the air from their over-inflated lungs. This action mechanically breaks down the delicate pulmonary arcolæ, just as we should burst a thin paper bag, by forcing a column of air into it. This fact is mentioned to show that, if undue force is brought to bear upon the areas of the pulmonary cells, and that force is not met by an equal antagonistic resistance from within, the cells must necessarily break down." From a confirmed state of this kind dilatation of the right chambers of the heart eventually comes on. Mechanical assistance to the lungs against the effects of the inspiratory force created by great or continuous efforts is doubtless given in the songs of sailors, the deep "hugh" of the paviour, and the like.

Spasmodic pains in persons of weak nerve force, and with a tendency to combination with hysteria, are decreased by exertion of mind or body, but especially the latter; whilst, on the contrary those of a sharp, darting character, with much heat and throbbing, are always aggravated by exertion. Where, however, there is fulness with flushes of heat, obviously connected with derangement of the digestive functions, the exertion of brisk walking is beneficial. And this explains why the plethoric person is often relieved entirely of a severe and obstinate headache, by a brisk walk of a few miles. The effect of exercise in removing the results of excess is well given in the language of the late Dr. Prout, where he explains a different state of things, namely, *the struggle of the organs themselves to eliminate, without the aid of healthy bodily movements to work off excess*. He also says, "the expenditure of power may be too great, the tissues may waste too rapidly, and thus more effete matters may pass into the blood than the excreting organs can remove; or, without this, either in the waste or

other reconstruction of the tissues, some substances may be formed and may pass into the blood which are difficult of excretion, or which disorder the action of other organs." Persons suffering from that form of indigestion, which is indicated by heartburn, dry tongue, sleeplessness, and inactivity of bowels, should promote an increased action of the lungs and skin by active exercise in walking,—by daily walking without intermission. In weakness and irritability of stomach, especially in men of anxious temperament, daily walking exercise is a remedy as well as a cure that should on no pretence be neglected.

Again, with reference to the phenomena of *spasm* and *spasmodic diseases*, the parliamentary reports on large towns show that the habitual inhalation of the impure air of these localities arrests muscular development, and increases the liability to *spasmodic diseases*. There is certainly more ground for believing, through the researches of modern physicians, that spasm is the result of a withdrawal of nerve force or nerve control, rather than the contrary, the proximate cause being the resulting defective nutrition owing to that withdrawal. The late Dr. Marshall Hall (we think it was), first insisted on the physiological law that "*the more rapid the nutrition the more sudden the exhaustion consequent on its arrest;*" and this law explains the sudden collapse which ensues oftentimes after spasmodic seizures, and also the enormous appetite we often behold after attacks of convulsive diseases, as in some cases of *epilepsy*. Rather than use the lancet in these cases we should pour in sustenance, and add as much *warmth* as possible. In the intervals between the seizures he greatly approved muscular exercise as strengthening its fibre. The whole law is more completely shown in the conditions of childhood and its disorders, as well as in the effects produced by the

physical activity which that period of life so essentially demands.

The struggles of a convulsive character of a person wounded and suffering from great internal hæmorrhage, like other internal bleeding arising from the breaking-down of vessels, do not commence till an accumulation takes place at certain parts of the frame, or till certain parts are rapidly deprived of blood, such as the nervous structures especially. There seems to be a singular responsiveness on the part of the nervous system to this peculiar condition of the circulation. For, in cases where the nervous system is injured by a sudden and severe shock throughout its ramifications, one great bound, or one short and severe struggle, decides the event in a moment,—as when a man's brain is pierced by a bullet. And this surely favours the theory of the production of many nervous diseases through errors of the general circulation.

Whenever we are led to consider or draw conclusions on this subject from the writings of the ancients we find three primary differences, such as have already been alluded to; one the preparatory exercise, another the treatment of disorders, and a third simply common exercise. The preparatory, according to Galen's interpretation of it, was motion done in a manner proportionate to what was to follow, performed briskly or otherwise, not only by motion of the body but by frictions, anointings, and similar measures. This was for the purpose of taking care of the body, though at times it was used *after* the heavier exercises, as Galen speaks of its being proper for the *athletæ*. Nor did the latter pass suddenly from prolonged repose to strong motion, as from contrary to contrary, without the intermediate course. When occupying a place in therapeutics, Galen makes each motion moderate in quantity and slow, interposing quiet before using more powerful force, now

done by frictions, now by walking, or other motions of the kind, which softened and soothed the body when oppressed either by too much exertion or watching and grief. He always ordered these after great exercises, lest persons should pass injuriously into contrary quiet. Even common exercise bore many distinctions, relating to quantity and quality, time, place, &c., as in the open air, or under covering, or in the mingled shade, to which the Greeks applied the term promiscuous. The *place* also was to be either hot or cold, of medium temperature, or otherwise arranged in the simple dry, moist, or medium condition. The motions or movements varied, being either continuous motion or intermission, or, if continuous, equal or unequal; but if intermittent, either by certain order or without order: and they were either anointed or otherwise. So that differences are found in the quantities of the motion itself, such are the exercises which harden after awhile, and those of numerous titles, such as short, mediocre, few, and middling. These are derived from the nature of the moving force, for if the force were great the exercise would be called great; but if little, little; if middling, middling. Galen has fixed certain differences from their qualities or conditions,—as a great distance may be measured in a short period by exercise, or a short distance often expended in moderate time; and this exercise is called swift, sharp, and ready, such as *running*, *fighting with a shadow*, the exercise of *boxing*, *wrestling* or the *pancratium*, the game at little ball and corycus, foot-race, and wrestlings in the palæstra. Or much was done in a brief space of time, such motion being called slow or gentle exercise, as slow walking, being carried in a litter. Besides it contrasted with force and its annexed swiftness, which was called strong and robust exercise,—as to dig rapidly, to throw the quoit, to jump without intermission, and to throw the dart heavily.

Others were called strong yet done without velocity,—as to dig, to walk up an acclivity, to curb four horses with the reins, to climb the rope with the hands, the use of the plummets, and all the exercises of Milo. Thus the strong and healthy exercises were called great by common acceptance, as may be comprehended from what Galen has written on the diseases of the people, in which he has placed hard riding among enumerated exercises. In a similar manner velocity was reckoned one with another among the smaller kinds, as well as the remitted, which the Greeks called effeminate; and some others without swiftness, as the *amudros* or languid and weak, among which were the carryings by chairs, couches, fishing vessels, and similar gestations. Therefore to repeat these differences we may say there were the preliminary, the medical, and the simple; the simple performed by some in the open air, by some under a roof, by others in the mixed shade, by others in a cold place, by others in a hot place, by others in a moist or dry, and by others in the medium condition of either. Besides they were either perpetual or constant, either equal or unequal, intermittent, regular or irregular, with much or little powder-sprinkling, or without, with much or little oil or without; in fine, they were swift, quick, sharp, slow and gentle, middling, and the small variety either relaxed, languid, weak, or between either of these.

There are only two doubtful points in the foregoing, arising from our dividing exercises into the strong and again into the slack and gentle, for Galen has distinctly laid it down that *every motion is not exercise, save the stronger sort*. The second point is that among other exercises we have placed *to dig*, which Galen has simply judged to be labour not exercise, but from the work connected with it *it is exercise*. To the first point it is easy to reply that exercise is commonly accepted by us as a

whole, though parted in different ways. The differences are of degree, not of kind. The whole arrangement is comparative, and that which was weak or moderate to the robust *athletæ* was at the same time powerful and vigorous exercise to those who were delicately framed or recovering from various ailments. The various games of ball of the ancients most clearly illustrate this point, as well as the numerous exercises appointed for youth.

We could say, by way of solution of the second point of doubt, that the character of most things is to be derived from their intents and purposes, and therefore oftentimes things that appear to be the same, if their ends be various, obtain various characters and various names. Suppose, for example, any one determines the actual temperature of the human body, simply for the sake of knowing it, *that* would be deemed the effort of a natural philosopher; but if, on the other hand, such knowledge is obtained for the purpose of altering or correcting faults in that temperature, it would be an effort relating to medical science. The same argument applies to digging. If the end of it be the culture and raising of the fruits of the earth, then undoubtedly it is to be called labour; but if it be only resorted to for the sake of health, it should fitly be called exercise. So that we may fairly reckon digging among the exercises. Many of the ancients of the higher ranks were wont to dig in winter, to cleave wood, to strike the barley in the mortar and skin it, for the sake of exercising the body, although this was indeed the common labour of countrymen and slaves.

After contending with the erroneous opinions which have been prevalent concerning exercises, showing at one and the same time that neither the bodies of all men should be exercised nor all be debarred its use, it becomes equally neces-

sary to learn what really suits the body in this respect. Now there were three conditions of the body mentioned by ancient physicians, namely, the *sick*, the *valetudinarian* (neutra), and the *healthy*; of which likewise there were many and different species. It would however be better for us to consider them under the following conditions, namely, those who are in the enjoyment of present health, possessing sound functions, although to some they might not appear perfectly healthy, and those who are infirm, or bedridden, or have their functions so seriously impaired as to render them totally unwilling or unfit for healthy work; whilst to our senses they may seem to be neither wholly sick nor altogether healthy. Again, they may be classed as the conditions *produced by indisposition*, by *bad formation*, and lastly by *solutions of continuity*.

What may be termed indisposition, rather than disease, arises from want of *moderation*. Of this there are very many forms, some simple, some complex; the former in which the body is disturbed without any other associated affections. With the ancients the latter was explained through the general doctrine of the humours being at fault. The ancient doctrine of the "humours" applied to a consideration of all the fluid portions of the body with exception of the blood, and was at once annihilated by Harvey's immortal discovery. The close observation of natural phenomena, however, which served to give rise to this doctrine, is worthy of the imitation of physicians of every age. In cases of solution of continuity, some part, or some member of the body, suffers from conditions proceeding from accidental causes, such being either from within or from without. So the entire plan of health appears the very contrary to that which may be called the plan of disease: the unity of parts is either perfect, or partially or utterly broken asunder.

From the earliest periods of the history of the human race there have been many doubts and disputes whether the sick should be exercised at all. Many contended, and very plausibly too, that it served to assuage the disquiets of sickness and enable them by this means in a great measure to recover their health. Several ancient physicians declare that the infirm should be exercised. Among these was Herodius, who is said to have removed fevers by running and games, though he is severely blamed by Hippocrates for *killing* his fever patients by too much walking. In a subsequent age Aselepiades partly imitated him in the happy mode with which he exercised the sick in his pensile beds and the like, thus imparting exercise in the gentlest manner. There were, notwithstanding, violent opponents of all methods whatever of exercising the sick. Galen and others took a middle course. They were not willing that motion should be applied arbitrarily, but, on the contrary, ordered that there should be great distinction and care among the sick themselves in the choice of exercises. Where there was a disposition to immoderate heat to the frame from active exertion, the stronger movements were condemned. Aselepiades is condemned for using gestations during the exacerbations of fevers, and, together with the administration of medicines, torturing his patients with vomits, fasting, want of drink and rest, and some days exercising them in walking, bathing, and the use of the pensile beds. In contradistinction to this, Galen has laid it down that while labouring under acute fevers patients should be removed from every source of motion; and in continued fever, and some maladies where the accessions are violent, they are on no account to be exercised. Yet there are conditions of chronic disease where Hippocrates directed a different course, as in the case of some infirm people, who, lest they should suffer still more, are to be expelled from bed. It was even inculcated that

the diet and fasting of persons in fever should be carefully regulated, and nothing done by chance. The fever was increased by exertion, and the body was then said to become more "arid and dry," whilst rest favoured the secretions and the production of moisture. Some sort of "dry" bodies, as they were termed, were really benefited by gestations, and even by moderate exercise, provided their strength permitted it. In some persons moderate movement seemed to excite the animal heat, though where the latter was feeble it was extinguished by excess. There were, however, various states of infirmity in which specific exercises were as much auxiliaries to improvement as they are to healthy development of the whole body.

To speak collectively, we may say that no body labouring under great indisposition is fitted for strong exercise, though many be found to which a sparing and moderate amount brings a good deal of aid. Those who have a dropsical tendency, or have some part of the frame affected with deformity, unless there be obvious impediments to the process, take considerable advantage from exercises,—which are often able to remedy distortion, to assuage discomfort, disperse inequalities, filling up, as it were, empty parts, and removing obstructions. They were even formerly practised in congenital deformities, yet with a force approaching more to violence than otherwise. Strong exercises applied fasting, or, as we suppose, combined with fasting, were the great remedy for grossness, in patients also who were described as scarcely able to touch their own breech with their hands, nor scarce move their bodies. On the other hand, slim and slender bodies, especially those worn by disease, were restored to flesh by slow and gentle exercise, which remarkably assists all the secretions, the nutriment being thus equally distributed, till they even become sleek and

fat. In this way Galen boasts of having cured many who were attenuated in the whole body and legs; whilst, as we have elsewhere remarked, the Emperor Germanicus was freed of tenuity of legs by beneficial equitation. So that certain bodies when seized upon by chronic disease, either from superfluity or debility, are not to be denied their aids, and especially where the disease is dormant and inactive, as in the case of small *calculi*, which by these means escape into the bladder from the kidney, and thus remove a source of extreme danger to the sick person. But in all cases of dislocation (unless applied *at once*, as rotation has been successfully), rupture, or dislocation from accident, until the reparative inflammatory process is subsided, these movements are of course inadmissible. The great progress of orthopædic science in the present day often, but not always, comes to the rescue of what is otherwise a slow and difficult, and oftentimes hopeless task, by speedily setting free the bonds of the deformed or contracted limb. In all cases when what is termed solution of continuity has taken place, no matter in what region, firmness and quiet must ever be insisted on.

CHAPTER X.

Effects of Exercises on the Skin and its Diseases—Obesity and Atrophy—
Proper times for Exercising, as well as the Choice of suitable Localities.

IN skin affections, and especially such as belonged to the squamous variety, the ancients depended much on strong exercises. Care and judgment are nevertheless required in selecting those which each patient can individually bear. This is especially to be studied in the case of old persons who suffer from these affections. In their case we cannot safely exhaust them even for a time by the efforts of exercise or cold bathing, both of which are strong processes with the aged. It would seem that although the ancient maxim “to ward off old age” is excellent in its way, yet when old age actually arrives it is wiser to husband what powers of life still remain; yet not of course by *sloth*.

Into the subject of skin diseases it is not our province to enter in a work like this. The general effect of exercise on all of them is much the same, namely, an improvement of the disorder through the increased activity of the bodily functions; and this is certainly more rational as a plan than attacking the skin solely. The tendency of men of the present day who reside in towns, is to treat the skin vigorously with all sorts of external appliances, to the neglect of bodily exercise, and thus in course of time to weaken irremediably one of the most important and delicate functions of their bodies.

To convalesceents gentle exercise was and is ever deemed of the first importance, and by it they recover the muscle and tissue they had lost during sickness. Galen has declared in the case of many old men that they ought to be cured in the same way as the sickly; for, as Aristotle remarked, disease is natural to age, and the aged cannot endure the manner of living which the younger and more vigorous bear. Yet to those who are thus sickly, yet not actually diseased, careful exercise of the body was chiefly resorted to, by which the whole frame was kept in moderate working order. In exercising such persons as these, our study should in every case be to exhibit gradual movements, beginning with those that are light, then short, slow, and slackened successively, increasing both their strength and duration as the bodily strength more and more increases. And this should ever be held in view from its having been so deliberately pronounced by Hippocrates (*sensim et per intervalla*), lest they commit the greater fault of passing unseasonably from one extreme to another, and instead of a restoration of strength greater weakness or prostration succeed. In the aged the passive exercise of a carriage is at least a substitute where moderate active exertion cannot be taken. For such persons four points should be regarded, namely, strength, condition of body, habit, and particular defects, such as are common to the bodies of old men. For them all the stronger exercises are to be laid aside, but gestation, and walking, short of fatigue, should be enjoined and followed. Plato mentions the injury done to old men from overwalking; and Galen tells us of the physician Antiochus, when near his eightieth year, being wont to walk daily the space of three stadia or furlongs, from his home to the Forum, and in the interim to visit the sick on foot; but were it necessary to go farther, he used a chair or other vehicle. A very interesting account is given of

the habits of an old Roman, who, in consequence of great care, possessed great activity of body and mind at the age of seventy. In the morning he kept his bed, clothed himself in the following hours, and walked three thousand paces; then read, talked, and contemplated; then ascended a vehicle, and, performing with this seven thousand paces, again walked a thousand; then sat down, or returned to his couch or to his writing. When the hours of the bath were announced, which were nine in winter and eight in summer, he walked naked in the sun, provided there were no wind, then played vigorously at ball in the open air; whence, after ablution, he laid down, and deferred taking food a little while. So far then as concerns old men there should be the same regulated scale from youth to age; for it did not escape the ancients that in the latter instance depositions of fat were observable in various parts of the body, as well as increasing slenderness, smallness or narrowness of chest, crooked or weak limbs, and in many other ways a receding from the common standard, so as to render them unfit for general exercises. In place of these they substituted vociferating for the improvement of the chest, walking for the legs, and the like. Custom has certainly authorised these methods of assisting the decline of life; whilst the already quoted saying of the Father of Physic is as applicable now as ever it was, who, when speaking of labour, says, *though they be weak or old men, yet they bear it more easily than those whose vigour has not been preserved by exercise*. In old age all exercises immediately affecting the head should be avoided; such as those which produce vertigo, deafness of a temporary or momentary kind, or affect the sight. And in the same way not only old men but men in general should manage these matters according to their years and the amount of chronic debility they may have gathered during the struggles and vicissitudes of early life.

It is necessary also, that even the healthy body should be exercised to maintain its sound and serviceable condition, whilst, should unforeseen demands be made upon it, they may be met by the additional power which careful training is ever known to furnish. The great wisdom of the ancient physicians was shown in their careful weighing and balancing of the physical and intellectual development of the framework of men, and we all know with what grand results. Galen comprehended their plan, from the remark he somewhere makes, that there were many well balanced bodies to be found in his own country. But of all the conditions and rules attached to these exercises, we have literally nothing for our guidance, though the world-wide celebrity which the old Greek nation has enjoyed for so many thousand years is proof enough that their system of education was reared upon no mean or transitory foundation. To the necessity for aiding the functions, even of healthy bodies, by exercise, we have enough testimony in the simple remark of Galen, that *the man who is used to moderate and well regulated exercise, possesses a body rendered free from superfluities*. He also lays down the axiom that should apply in *all* cases, that *no exercise should be violent or immoderate*. Digging, and the like, ensure health to those who follow them, provided they be fairly temperate and careful; so do quick and strong motions the robust, especially if they are accustomed to them, whilst in moderation such are adapted for nearly every one. Therefore, the selection should be made with reference to custom, age, universal habit of body, particular ways of living, and temperature also. As a proof of the necessity for these precautions, Galen mentions what many of us may have observed, that a person is liable to derangement and even to fever, who exercises sometimes less and sometimes more, and especially to the latter when the accustomed

exercises are abated and discontinued. Some were remitted in the case of old men, boys and youths required fewer, whilst every one was accommodated according to his years, being prohibited none, except such as were obviously more adapted to the *athletæ* than men generally.

Regarding those sad conditions of the body, namely *corpulency* and *obesity*, we should be glad if the testimony contained in such a pamphlet as that recently put forward by Mr. Banting received more general attention; for it is rare that men will either follow out rules demanding great perseverance or give the world subsequently the benefit of their experience. The facts, however, mentioned in the above and other brochures of the kind, have been long known to the profession, and if its members have rarely applied them with success, it is owing to the wide-spread error of our nature, not only in this, but in other matters of health, the “sufficient unto the day” which opposes itself too frequently to the dictates of science and reason. Those who appreciate the difficulties in the way of carrying out a long plan of moderation and self-denial will readily comprehend this. In treating *obesity* also, there is more than one thing to be considered. It is not merely *diet*, and not merely *exercise*, that will cure the malady; for the tendency to the formation of *fat* in enormous quantities through the frame is peculiar to certain individuals, of certain temperament, usually the lymphatic, and with these, certain articles of diet feed the progress of the disorder. These articles of diet will in most persons produce no abnormal action of the kind, any more than we can hope to fatten a very thin person simply by their means. The fault in the first instance lies with, in simple language, an over-excited functional action of certain organs or processes of the frame, not at present fully understood. Observation and experiment, however, have shown

that the chief articles which form the pabulum or food of this error of assimilation, or as the ancients would say, of concoction, are such as contain fat, as in milk especially, sugar, and starch, the latter being converted into sugar during the digestive process, either in the stomach or liver. The equivalents to these are all articles, such as beer for example, which contain fermentiscible material; and thus farinaceous food, sugar, fermenting wines and liquors, are to be totally excluded, or curtailed to the smallest degrees of quantity. Under these circumstances *obesity* may occur at almost any period of life, being induced in youth, as well as in advanced life, by the above causes. In the latter instance it precludes great age; and we have not been able to find any recorded testimony, though exceptions there may be, of fat people in old age lasting as long as thin people. This should at least be a comfort to the latter when grieving over the *contour* of days gone by and their once fair proportions. To check, prevent, or remove *obesity* four points claim our attention; first, the strict diet* before mentioned; second, active and strong exercise; third, moderation in sleeping; and fourth, the moderate use of the bath. We strenuously advise active and *strong* exercises for this purpose, for we have found that the lighter and slower exercises only increase the evil in many persons. And this we suppose to arise from the assistance given to the existing morbid function by moderate movements, while the stronger and more active, as they often will in other cases, overcome this error of

* The great importance of *dietary* rules is equally shown in the case of another class of persons, the very reverse of *obese*, who suffer from the form of *dyspepsia* known as "oxaluria," only another degree of mal-assimilation, and in whose cure it is often necessary to exclude all vegetables, and even butter and sugar. Another example, too, of functional error.

the system, and give it, as it were, an impetus in the right direction.

Above all other purposes the ancients most commonly exercised against fat and obesity. Hippocrates recommended rapid journeys to the corpulent; and Galen took down the fat of a man, who for forty years had been gradually increasing in bulk, by the use of swift running. On the other hand, persons of slender make were desired to remain in comparative quiet; the rule for them was, that *the slender when about to undertake a journey should walk with slow steps*. It must, notwithstanding, be borne in mind that if bodies are attenuated, slender, or weakly from impediment or defect in the distribution of nutriment, which we comprehend by the term mal-assimilation, exercise agrees with them. In the same degree all parts of the body, ranging between the thin and fleshy, are to have their amount of exertion apportioned out to them. We may remark, that the same applies to the matter of daily living, as to eating little and exercising little, and so on in proportion, according to the law of Hippocrates—that *it is not good to labour when hungry*. The man who eats much should exercise much, according to another axiom of the same writer—that *the man of full diet cannot live healthily unless he labours*. Grossness and fulness, wearing out by constant repetition the bodily functions, lay the foundations of organic mischief. Those who in the same way sleep much, and profoundly also, stand in need of many exercises. That the action of the skin is feeble then, the circulation languid, and internal congestions rife, are things that were evident even in those remote ages, for Aristotle speaks of somnolent persons losing their colour, whilst their external circulation demanded the stimulus of exercise. In some cases this is particularly exemplified in the large secretion from the kidneys during the night, which at

that period can only be mitigated by the increased warmth which sleeping encased in flannel may impart to the surface of the body.

The latter condition of temperature should be carefully studied, especially towards the decline of life, and where symptoms of *atrophy* begin to declare themselves, for such persons should then be almost excluded from exercises. The ancients considered that the passionate also, and the ardent, and those endued with choleric tempers (*mordaci calore*) require *moderated* exercises, lest they should be made hotter still by additional movement; for with them, as Galen writes, their natural movements alone suffice for all such purposes. Whence Aristotle, seeking out the cause why some became fat by sitting, others grew lean, said it arose from some being cold, some hot, others relaxed, or the contrary. Those who were hot were made fat by sitting, as their heat increases that tendency. The tendency to fat is observable in all hot climates, especially amongst the upper classes, or persons who are pampered in luxury and idleness. The person of cold temperament was supposed to grow lean, because it seemed as if his animal heat and digestive function were rendered utterly torpid by quiet; and the same applied to the excretions. Hippocrates alludes to these kinds of temperaments, where he says, that *the cooling from natural excitements or heats requires a drink of water and repose*; and in the same vein he declares that *labour and food are to be diminished with those whom thirst disquiets on account of heat*. From which it is sufficiently clear that cold or phlegmatic bodies are to be exercised strongly and continuously. It was remarked by the ancients that women, from their relaxed or humid temperaments, passed through life healthily and with less suffering than the other sex, and still more so if they took their modicum of labour or

exercise. And Aristotle very properly observes, that there was little difficulty in carrying the womb during uterine gestation where labour served to consume what largely accumulated with women who are unemployed and of sedentary habits. Such advice will bear the test of reason and experience in all ages.

We must next notice the force and propriety of the arrangement of *localities* for exercises, which did such honour to the ancient physicians in their selection. With us, the difficulty is to get persons to leave their houses and rooms unless, "weather permitting," they can safely do so; that is, if there be no wind, while they could both obtain fresh air and avoid wind if they carefully chose their localities for walking, and kept to those spots and places. The foresight of the ancients in this respect exhibits quite the impress of nature, which shows by its existing arrangement how the bodies and minds of men, as well as the faculties of brutes, are influenced by climate and locality. For places and regions exist in which, if these precautions are taken, the happiest results, or the contrary, ensue. In Sierra Leone, the Gambia, and the settlements of the Gold Coast, deadly as their climates are said to be to Europeans, perfect health may be enjoyed, with exercise and moderate diet, at certain places inland and at certain elevations above the sea. The first condition with the ancients was, that *the place be open to the best winds, and defended from the worst*; whence they chose places facing the north and east, from which, in that quarter of the globe, the Grecian Isles, the most healthy winds blew. They were constantly preferred to those of *western* or *southern* aspect. For the former neither distressed them with immoderate heat, nor did the position affect them by its cold and moisture, nor by pernicious vapours, nor by gales of wind sweeping in; but regarding the latter, besides the intense heat and cold, which were separately induced, now

at one time, now at another, they often suffered from excessive perspirations by reason of these winds. Still, if places could be found where they were screened from the action of these winds, they would, doubtless, from their temperate character, have superseded the others. Care is necessary where bodies are exposed through the heat and motion of exercise to be seriously affected by these winds, especially while resting during these efforts. These places, thus adapted for winter or summer use, had baths of the same kind attached to them. Those for the winter were said to have been tempered by being exposed to the noonday sun; but the summer baths, such as those in Rome, which were placed between Mounts Cælius and Esquilinus, were in the deepest and most agreeable shade.

The second point in the selection of a place was, that *it should be open, not shut up, and not dark*, because more agility and liveliness were imparted to bodies when exercised where the air was free and less confined than in dense, heavy, and confined atmospheres. As we have already said, there were places built on purpose for walking, and many preferred the open to the covered walks. The effect, however, of covered walks is greater probably than even at the present day we are at all aware of. One singular instance has been noticed in malarious districts in warm latitudes, that if a person sleep under a covering, if only an awning, he usually escapes the fever which often follows where this precaution is not taken. Walking in the public roads was thought by them better even than the ordinary stadium, producing less lassitude, probably from there being less sameness, which is a great point in choosing where we shall walk. The *odos*, or *way*, was said to have been one of those tracks without the city, formed without art, spread out by no rule, irregular and unfinished, and made either by nature or traffic upon it. Celsus, in that *multum in parvo*, the

second chapter of his first book, considered that persons were less wearied with walking in the ways than in the straight and public course. In the latter, the movements of the body had too much of sameness, but in the former, that is, in the rougher and more irregular ways, the labour was more generally distributed over the entire body, and thus they were actually less fatigued. This would not apply, however, to long-continued walking, if in the same proportion, in any other of these ways. The mind is more relieved and the senses gratified in the public irregular way, which alone will account for the lessened sensation of fatigue. Under the latter circumstances alone, the invalid should be instructed to give constant change and variety to his walks. Aristotle expresses this by recording that individuals were more fatigued with walking in short ways, constantly retracing their steps, than those who, walking in the longer ways, never have to repeat their distances. In the academies, under the plane trees, straight as the walks were, the mind was yet occupied with the novel and pleasing thoughts of the learner in these philosophic haunts. In the latter also, they had the benefit of pure air in open spaces.

The third consideration of this subject shows that they were very careful not to exercise near marshy and infectious places, too near the sea, and where the temperature varied greatly. This of course applies to strong exercises, and not to ordinary walking. The buildings fitted up as *gymnasia* were made hot in winter and cold or temperate in summer. This sort of protection, namely, that of a building, is especially necessary in hot climates, where persons should carefully avoid sitting in the sun after exercising.

We shall next consider the fact that there always have been suitable *times* or *periods* for exercising. First are comprehended the seasons, spring, summer, autumn, and winter ;

secondly, the hours of each day separately considered. With these are to be included the atmospheric conditions, namely, under southerly or northerly winds,—too cold, hot, dry, cloudy, serene, light, and fleecy, coming like accidents irregularly and contingently. The rule was to avoid strong winds, which undoubtedly injure some infirm bodies, and distress all who labour under chest affections, and especially if these winds were in the extremes of cold, hot, or dry. The condition of perfect physical repose which accompanies that wondrous arrangement called the hybernation of animals, speaks of some part at least of the general effect of exercises. It was known to the ancients as to ourselves that *the more running we have in the winter*, as Aristotle expressed it, *the more stiff we become by standing*, and these rigors, so to speak, are in due proportion to the extreme state of cold in the atmosphere around. Serene and bright hours may be chosen as the best for exercising, but the cloudy, the obscure, and the heavy are to be shunned. Even Hippocrates troubles himself with remarking how much both the stomach and the spirits are changed by the constitution of the hour.

Most authorities agree, among the ancient writers at least, that *the human body needs exercise more in summer than in winter*, comprehending by the latter, the autumn, winter, and spring. The main reasons for this view were that accumulations are more likely in the body, and of course more dangerous then, when, as in winter, and as in the store of fat in the bodies of hybernating animals, they are rather serviceable than otherwise. There was also a natural languor to be overcome in summer, which did not exist in winter. Hippocrates desired that men should be cautioned regarding *three things in exercising,—to avoid fatigue on every occasion, to exercise the body by walking in the morning, and whilst exercising*

frequently and for a long time in winter or cold weather to cease before experiencing lassitude and heat. Every one must in truth perceive that there is less danger in the summer from the heats of exercise. Pliny, the younger, writes of exercises wont to be done by himself in summer time, when interrogated how he had passed the day.—“When it is about the fourth or fifth hour (for the time is neither certain nor measured) as the day prompts me I go into the vaulted porch, meditate, dictate, and then ascend a vehicle. Then also, sometimes walking and throwing, with a design of strengthening myself, and feeling restored a little by the change, I sleep, and then resume walking; presently I read a Greek or Latin oration clearly and carefully, not so much for the sake of the voice as the stomach, as the latter is equally strengthened by it. Again I walk, anoint, exercise, and wash. Sometimes I vary the order of this, for if I have daily used the throwing or walking after a short repose on a couch I join the hunt, not by vehicle but on horseback, being easier and more speedy.”

In another part of this work we have written of the Hippocratic maxim that *exercise should precede food*; and showing how it is at times advantageous after food. The rule certainly does not hold good after severe hunting, when repose should come between the great exertion and the taking of food, the latter of which should be delayed till the person in some way has recovered from the fatigue. With the ancients a little motion was considered suitable to the digestion of food in the stomach, especially where they were prone to sleep after meals, and this agrees with the dictum of Aristotle where he directs them *to walk after supper, lest the food float at the mouth of the stomach*. Yet, even in sleep, the stomach is assisted by the movements of respiration, chiefly of the diaphragm and abdominal muscles. The ancients had a notion that if exercise were commenced too

early the constituents of the bile became as it were paler and less fitted for their proper office in the frame. Very little however was then known of the latter wonderful secretion, but its temporary derangement in the body did not fail to strike men of such observant minds. The *second* rule maintained by them was, *persons should not enter violently on labour or exercise hungering, or with an empty stomach*; because the stomach would, after the general exhaustion of the system, be less fitted to receive and digest food. The third rule was one we have just reverted to, namely, that *food is not to be taken immediately after exercise*, but a moderate interval allowed between the two, until in fact the agitation of the frame be calmed down. Yet when much exhausted, and the breathing rendered quick, it was advisable to take food. Nor is cold water, or wine, as some have recommended in ancient and modern times, to be taken directly after violent exercise, especially as the stomach is empty. There is some apparent danger in using the former, whilst the latter is not borne by the stomach without speedily affecting the head; for which latter reason, if we may believe Galen, the *athletæ* avoided it after their exercises. On the contrary it is averred that many such died from drinking cold wine after great exertion, some very suddenly, whilst in others the liver, and at times the nerves, appeared to be affected in consequence.

Concerning the best as well as the particular hours of the day suited to exercising, the whole argument is drawn from the way in which healthy men employed themselves in exercising their bodies, and we find it recorded that the *mid-day hour was the best in winter*, when the condition of the atmosphere was more temperate; and *the morning the best in summer*, so as to avoid the heat of the day. We read that Alexander, king of Macedonia, arranged his dietary plan to agree with

this, for he took the morning walk to season dinner, and a small dinner to season supper. It is mentioned by several authors that the gymnasia were open before sunrise. About that time the runners first appeared, joining together in lighter exercise; but at mid-day the heavier kinds were wont to be practised, as the contesting and wrestling. In the evening, in autumn and winter also, unless there were some cause to prevent, they also exercised. For at these times it was colder in the morning, and some days were short, and parts of them consumed in necessary business; and besides they were better able to digest food taken in the morning than in the evening. Galen mentions that the Emperor Antoninus, who was most careful of his health, on the shortest days entered the palaestra at sunset, where he seems to have exercised himself with the ball, running, and boxing, being greatly pleased with exercises of this kind. There is sufficient testimony that the eighth hour was that most commonly used by most men. Other hours suited other men. It is said that the Emperor Alexander Severus, if necessity compelled it, gave his attention to his duties before daylight. After devoting himself to civil or military affairs, or reading various Greek authors on government, he lay down, and subsequently attended in the palaestra to quoit playing, or coursing, or gentler games, then anointed and washed himself, but always in the cold, never or rarely in the hot baths, remaining generally one hour in the water; he also took, usually on an empty stomach, a pint-and-a-half of cold water. Coming from the bath he partook plentifully of milk and bread, then eggs and new wine, and, refreshed with these, he sometimes abstained altogether from dinner, deferring the latter till supper time. Horace gives a somewhat different version of the style of living of himself and other choice spirits. The foregoing seems to be a general outline of their

“suitable times” for exercising. *Our* arrangements, as well as climate, differ from theirs, and it should be remembered that the ancient Romans always separated the days and nights into twelve hours each; and some were to be called long as in summer, others short as in winter, and others equinoctial as in autumn. Galen mentions that the most useful hours chosen by [them were] two, four, six, and twelve; after which, according to his showing, no other number seemed to hold good till the twenty-fourth. It remains, however, to be seen whether in respect of the hours for exercise the moderns can in any way adapt or accommodate themselves to the hours of the ancients.

Then as to the *quantity* of exercise that should be taken, we may say that a good deal of attention is required by individual cases, and it is the fault of those who do not portion their daily labours to what they can bear that so much mischief happens to the body. The mind and body are too frequently now-a-days overworked together. The labourer toils with the one, but knows not the more speedy consuming power of the other. The ancients who made much of exercise, of course paid special attention to these points, whilst grievous errors are said to have been committed by those who neglected these precautions. The intelligence and care of the medical attendant usually prevent the latter, whilst the former opens to all a highroad for themselves. The end of all exercise, whether in larger or smaller quantities, whether continuous and sustained, or slow, gradual, and at intervals, is to impart strength to the muscular system, and enliven as well as invigorate every function of the body. By this means, namely, muscular exertion, every channel of the circulation is augmented in bulk, and, as a result, the vital force in every tissue is largely developed. The latter, however, tells us that we can wear out the body by over-exertion as

readily as we can by over-eating and drinking, though certainly not in the same ratio, whilst moderation enhances every blessing it is intended to convey. In ordinary cases exercise should be continued as long as the feeling of increased vigour and joy is felt, while the face retains its florid colour, and neither lassitude nor pallor of countenance are perceived in however small a degree. At this point, if it were continued, the body would lose vital force instead of maintaining as well as developing it. The ancients paid great attention to the condition of the perspiration during exertion, and we imagine their chief endeavours were directed to prevent the effects of sudden chill by prolonging and regulating the exercises accordingly. Strong individuals can exercise a long while, though some are soon fatigued, but yet are able to recover themselves very speedily. It is assuredly fit that the weakly should be exercised but little at a time, and if with increase of force it must be very gradual; for if they suffer ever so little from its effects they are with difficulty restored, and that after a long period. They should not be allowed to perspire largely. Whilst old men exercise themselves they should take every care to avoid sweating, though such a condition be rarely attainable. The result of their attempts should be an equable moisture on the skin; whilst, ceasing altogether at the sensation of fatigue, the true end should be to produce the excitement of hunger. We learn that Socrates when an old man was wont to exercise himself until he became hungry. Men—among whom are comprehended all existing between the periods of adolescence and old age—require moderate exercises; for either they are hurt if exercised more than meet, or derive little profit from it, or if less, they in some way contract a depraved habit of body. How admirably, then, is this means of health adapted to all these! Boys towards the twenty-first year of their age are

well able to bear much exertion, yet it does not exactly suit such to labour. Before their seventh year care must be taken so as not to hurry development too much, which would be plainly against the order of Nature, and on account of which Galen condemns some of the pædotribes of his day because they exercised boys more than was necessary. We ourselves have witnessed several sad examples of this, especially where boys have been hurried in their growth, and weakened both in body and mind, by special exercises which were considered necessary because they appeared *too small for their age*. If such is the case with others, we would advise parents to be cautious how they seek to remedy by exercise what is but the wise economy of Nature. In the same way, Aristotle censures the Lacedemonians for rendering their boys savage and unruly by too much labour and exercise; just as some nations, which, studying to generate in boys the bodily habits of the *athleteæ*, both deformed their bodies and impeded their growth. For among those who conquered at the Olympic games there appeared only two or three who as youths and as men acquired renown, because, through violent and variously-applied exercises to boys, their innate strength did not increase in direct proportion to the increase of body; nor, judging by analogy with other functions and laws of the human frame, is it reasonable to suppose it would. Boys, therefore, may be exercised a good deal, but not immoderately, or for any artificial purpose or intent to contravene the slow natural processes of development and growth. In many respects it suits boys better to be exercised in the winter than in the summer, care being taken that they are not suddenly chilled by cold. The spring is also a good time, whilst the summer and autumn are more trying to them, mainly in consequence of the almost desperate vigour with which youths engage in their games and exercises. This

doubtless arises from the popular forcing of development and growth, especially of the former.

Those who lead a temperate life, abounding, as the ancients simply stated it, in few superfluities, appear to stand in need of few exercises; still, these should be used in moderation lest their members become torpid by ease, and they relapse from their usual and proper habit of body. So much the more then should the excrementitious material engendered by full or free living not be suffered to be retained. However quaint the language of these old writers, there is great force in their arguments, which were all based upon the observation of the phenomena of nature. They recommended, as we might justly do, much labour and exercise to *consume* the large aggregation of superfluous humours and excrements; noting also that these produced healthy digestion and sound sleep. Galen observed that diggers and reapers, notwithstanding their depraved habits of living, which seemed to hurt them little, were thrown readily into the profoundest sleep, digesting and assimilating their food in the most perfect manner. On the other hand, the oppression of food and drink with the higher classes, forced them also to exercise for its removal. Everyone knows that the sickly, who are gradually becoming convalescent, should make use of a little exercise, because in them especially the existing strength is small, the animal heat low, and the circulation without its wonted vigour. They must be exercised very gradually, and short of fatigue; and as their powers increase so also should their exertion be increased in due proportion till strength is restored.

It was well known to the ancients, as it is to ourselves, that there is ever some danger in exercising those who are unaccustomed to exertion of almost any kind. It was feared,

and justly, they might in consequence be attacked with some dangerous maladies. The plan was to exercise them very gently indeed for some days, afterwards to increase by degrees, so as to arrive at the point which agrees with those unaccustomed to exertion. In this respect it is evident that immoderate and too rapid exercise is injurious to everyone, taking, as it does, from the healthy growth of boys, creating inequalities of relation between mind and body in some men, as the *athletæ* at times were said to become mad or maddened; and sometimes it gave rise to fever. Galen distinctly says that immoderate exercise produced in old men incurable weakness, and affected all persons in the same ratio. We believe it to produce the same in persons who have prematurely aged themselves by certain indulgences; and with reference to the form of paralysis of the extremities resulting from the latter, muscular exercise is often dangerous. *Paraplegia* resulting from cold, depression of mind, or other causes, evidently differs in this respect from the above form; for exercise has ever been the mode of treating it. In the other case, however, the future safe existence of the individual seems almost entirely to depend on the perfect and complete paralysis of the extremities for the remainder of his existence. Any attempt made to increase or revive the lapsing spinal influence over those extremities would appear to favour a breaking-up of the entire system. As the tree falls so must it lie; yet there is some consolation in knowing that, though part of its vitality is, as it were, lopped off, there is the trunk as well as some branches remaining, which may still retain the activity of living members.

It was often observed that the *athletæ* grew pale and were unusually languid after severe exertion; and we recollect a striking example of this in the case of a gentleman, previously notorious for his powers of physical endurance, who suddenly

lost, and never afterwards regained, his former strength, after a long and unusual pedestrian feat, which he accomplished but fell down exhausted immediately on his arrival at the goal. The distance he travelled without repose, or we believe refreshment, was said to have been between thirty-five and forty miles. Different indeed from this was the manner of exercising among the ancients, who first noticed that digestion had been perfected and the excretions healthily parted with. When in this condition the greater part stripped themselves, were moderately rubbed until the outer skin assumed a florid character, the joints became flexible, and a degree of agility was exhibited in every motion. They were anointed by rubbing with sweet oil; and, that it might more readily penetrate every part was pressed and chafed with the hands. Some were wont to be exercised in the games after this form ofunction, or in wrestling after being sprinkled with powder; others forthwith joined in exercise, according as one plan was more useful and grateful than another; after which exertion they rested a little while, and were then scraped and purified with iron or cloth strigils. After this performance they were sometimes again rubbed, that is to say, friction was used, while others were similarly anointed in the sun, others before a fire, as mentioned by Celsus, and thus they frequently entered the bath in a high, light, and spacious chamber; and rarely, while clothing, partook of refreshment. And this was the common practice of those who frequented the public gymnasia or the private places of the kind, for the sake of health and forming a good habit of body. Those who through business or occupation could not exercise in the ordinary manner, were directed to make up for it by frictions, unctions, and suitable abstemious diet, and thus obtain the same end that ordinary exercise would bring to one whose diet was not so restricted. Galen

desired them, as we do, to make it their business to carry out these things, or at least some of them.

In our days we have few gymnasia, rightly called, few gymnasts or pædotribæ, nor have we anointers and rëanointers, and few who properly administer friction. The majority of these we have not, nor do we need several of them, but we are offered many forms of bathing as *substitutes*, even though history forewarn of the result. The Greeks, and for a time the Romans also, made their bath an adjunct to—a following after—exercise; and the two together were truly “pillars,” the one of Hercules, the other of Apollo.

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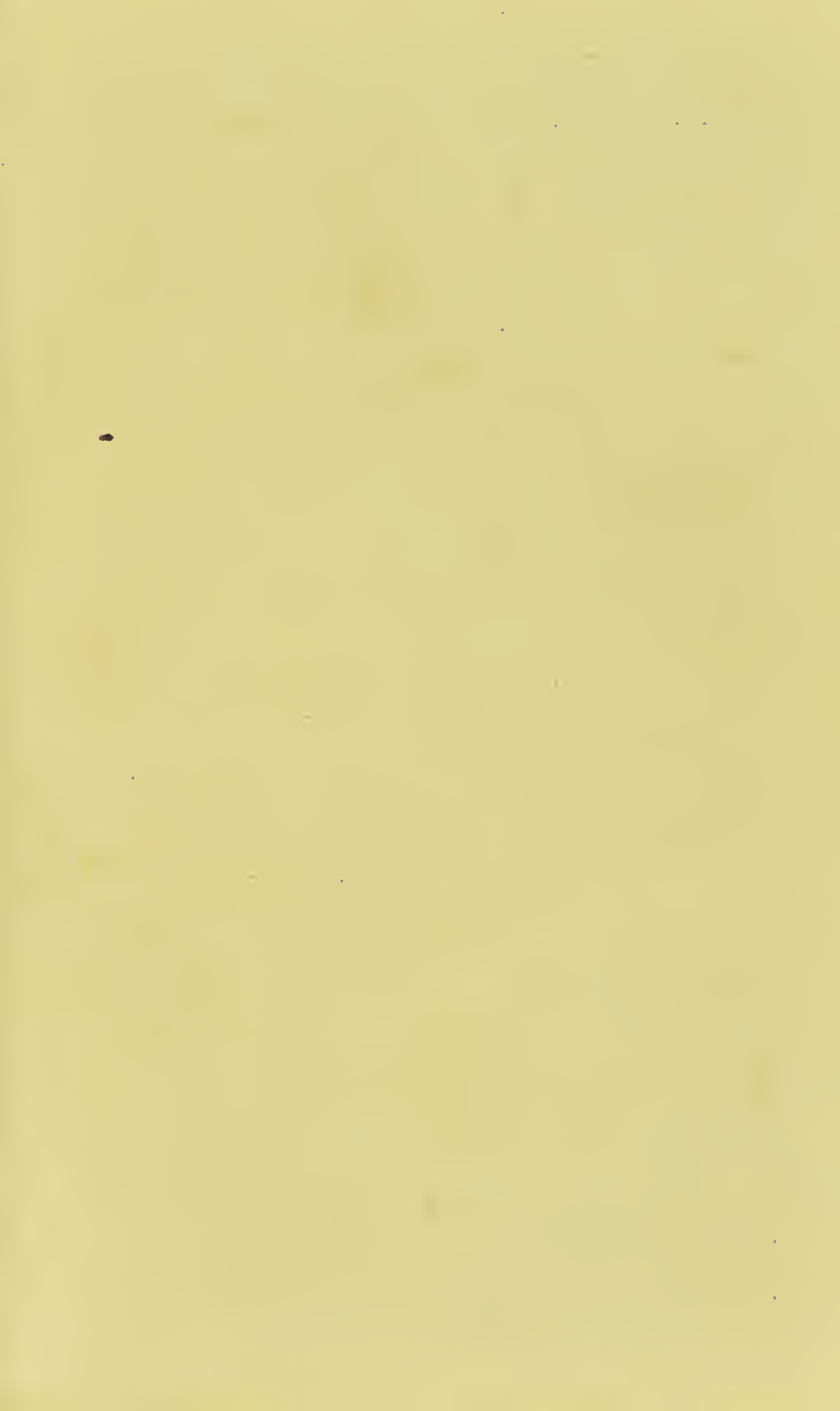
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